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A. LUMLEY DEL. R. TENEYCK SC.

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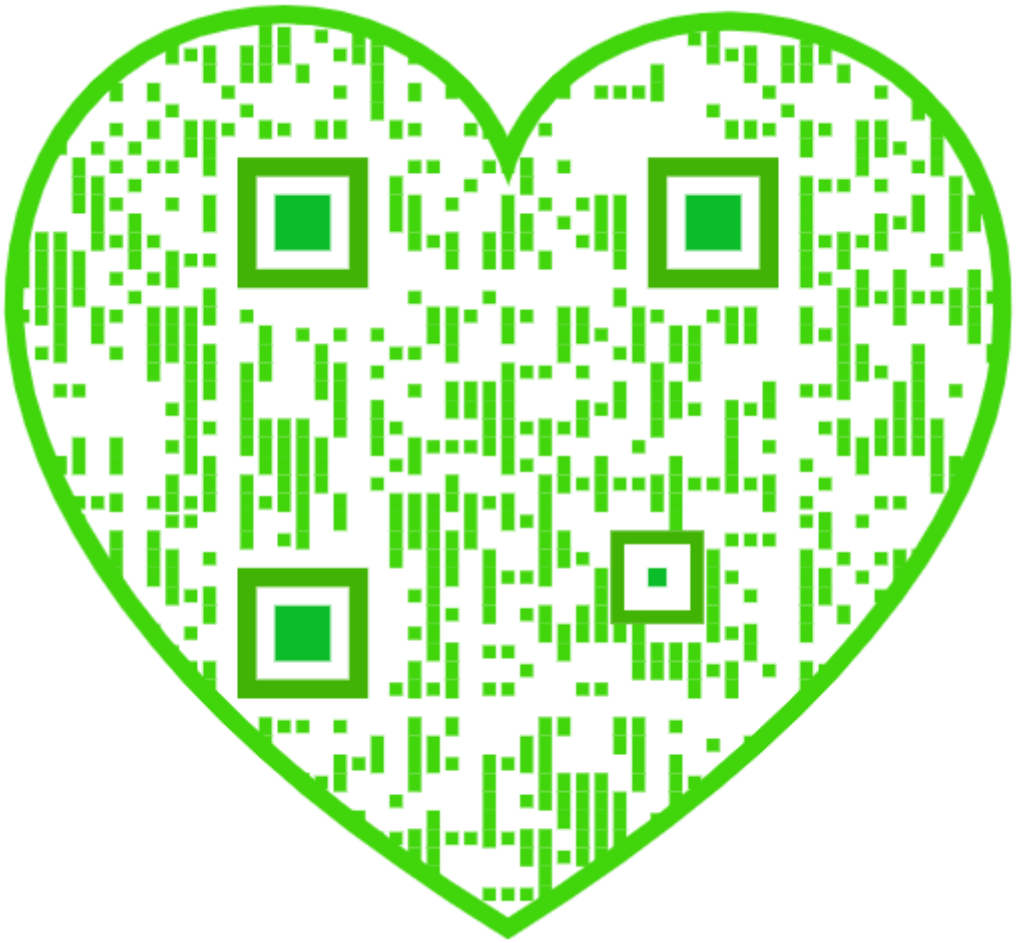

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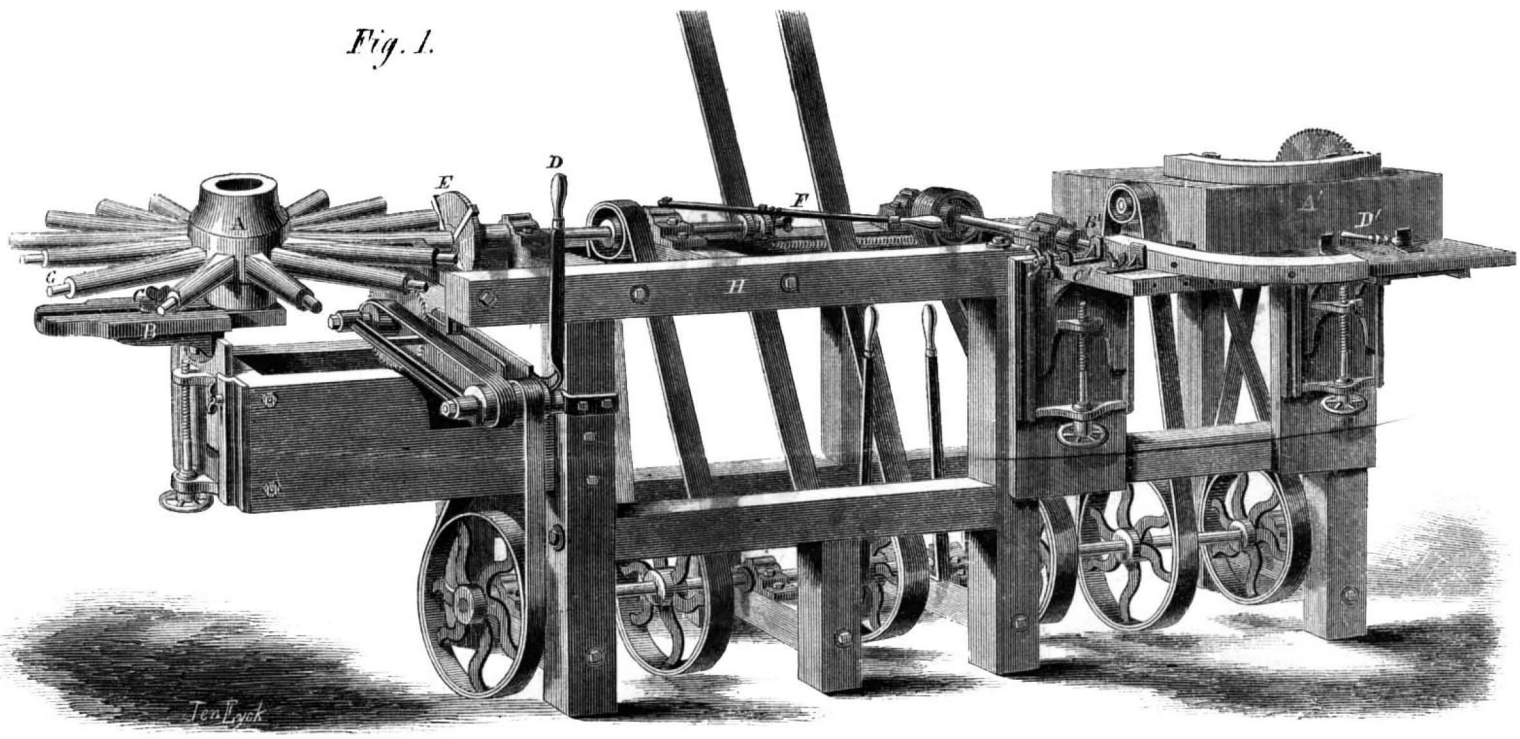
Fig. 1.

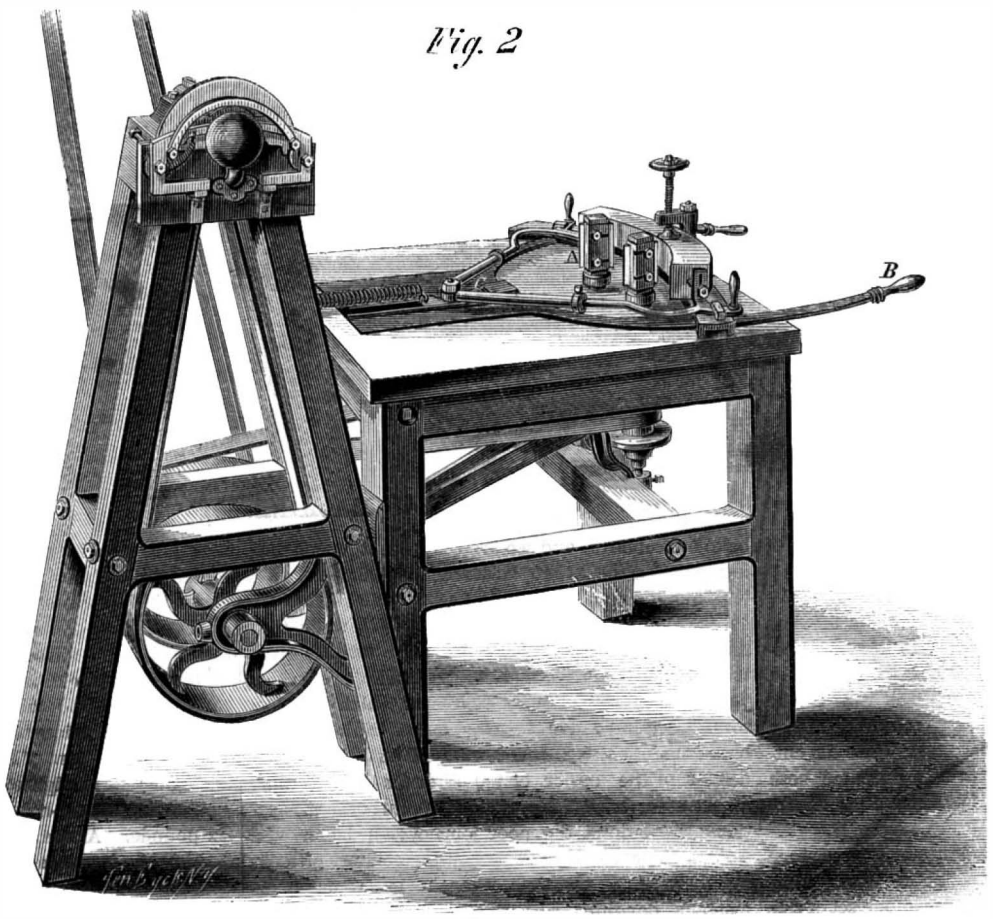


JACOB'S SYSTEM OF WHEEL MANUFACTURE.

The process of making wagon wheels by hand is a tedious and most unsatisfactory one, on some accounts, as the excellence of the finished product depends entirely upon the skill of one man. Indeed, the individual who takes the wheel in hand to perform the last touches may, by his want of skill, impair the work of better men who preceded him. There are other considerations involved which render the adoption of machinery desirable in this branch of manufacture.—The saving in time is also an important item in these days of competition.

Jacob's system of wheel-making, which is here illustrated, takes the wheel after the spokes have been inserted in the hub, as shown at A, Fig. 1, and from this stage onward entirely completes the job, so that it is in all respects a finished piece of workmanship. To do this duty three machines are provided. The first of them is the figure above. In this machine the wheel, A, is placed on the table, B, and fastened there by the fixtures, C, so that while it is perfectly firm it is also free to revolve on its center. A circular saw is then brought up by the handle, D, so as to cut off the end of the spoke to a certain length. This operation having been performed, the hollow auger, E, is moved up by the lever, F, and the shoulder, G, on the spoke, is also made to a specified and previously-set distance from the center of the wheel. When the fellies are put on, therefore, the wheel will be comparatively true all round, and the several parts will have a neat fit, one with the other.

Fig. 2



These details just described are all fastened to the frame, H, and are driven by the belt seen above.

At the right of the frame may be seen the appurtenances by which the fellies are fitted up. The fellies have previously been sawed out to the proper radius. The ends, however, have to be squared off, and cut to a certain length. This is done on the table, A'. By the use of gage irons, set in the table, the end of the felly is always made perfectly square with the radius of the circle it is on. The holes for the dowel pins in the end are then bored by the bit, B', and the gages, C', also guide the work so that it is perfectly true with the joint face. The spoke holes are bored with the bit, D', by the use of gages also.

After the fellies are bored they are removed to the machine seen in Fig. 2. This machine dresses the entire inner surface of the felly, rounding it off perfectly to any desired curve, and forming a handsome oval about the spoke hole. The rounded surface is given by the cutters, A, which run at a high velocity and are made of any shape desired. The felly is carried about the cutters by moving the lever, B, and there is a slot of peculiar shape in the table at C. The oval above alluded to

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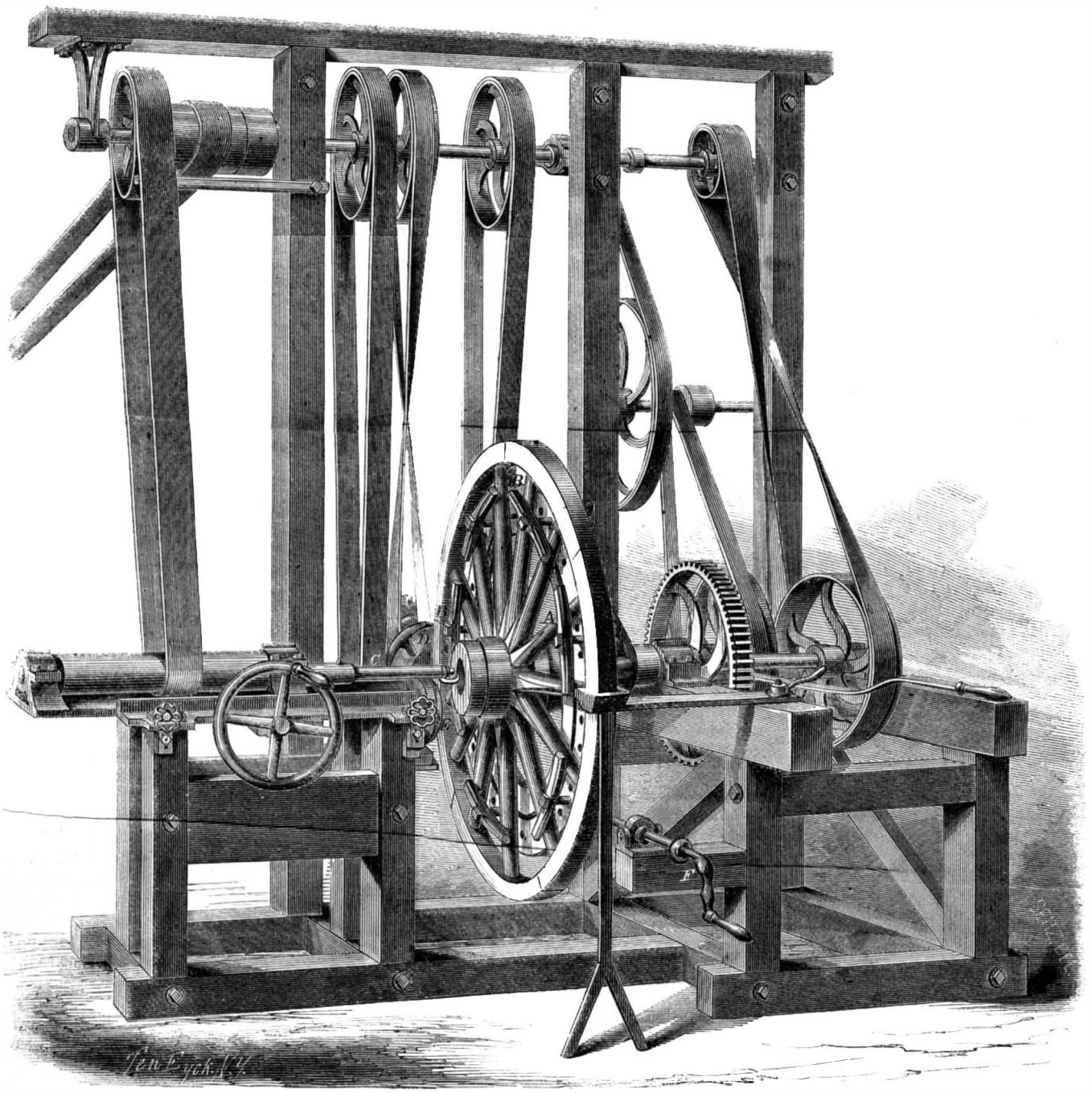
is formed by moving the fellies away from the cutters to a certain distance. Another rounding machine for bent fellies is shown in the vertical frame, D. This machine makes a perfect semicircle, leaving no flat or plane surfaces to be removed by hand afterward. The cutters can be made to work as close to the spoke holes as desirable; this feature is novel and has never before been accomplished

After the wheel is all put together, which occupies but a few minutes, so perfectly do the parts unite with one another, it is removed to the machine seen in Fig. 3. This machine dresses the whole surface of the wheel rim and bores the hole for the box at one time, and is to us the most interesting one of the series. The wheel having been chucked on the face plate, A, is fastened by the clamps, B, in a few seconds. The boring bar, C, is then set revolving at a high rate of speed, while the wheel itself runs in the opposite direction. The cutters in the head, D, then revolve against the tread of the wheel, while the cutters in the heads, E, one on each side, dress off both faces of the rim at once, being graduated as to the amount of wood they remove by the handle, F.

The result of these several operations is to produce a most beautiful wheel in a very short time. Fifty heavy wheels a day is a fair average for one set of this machinery. All the joints are perfectly true and smooth, and the entire appearance is neat and mechanical.

These machines were patented through the Scientific American Patent Agency, Sept. 15, 1863, by H. S. Jacobs, in England, France and Belgium. A company has been formed to work these machines, and some of them are now in operation at No. 147 Bank street, this city. For further information address Jacob's Patent Wheel Dressing Machine Co., 99 Wall st., New York. The entire patent is for sale.



WHEEL MANUFACTURING MACHINE.

French Bread-makers.

The trade of baker must have been in the olden time one to try the temper of the most patient of men. At one period, a Paris baker could light his oven only on 290 days of the year. He could not bake on Sundays, and we are told that it was amusing to watch the bakers standing in their doorways on Monday mornings with their ears stretched, to catch the first sound of the matin-bell, when they might light their ovens. Then there was the great trial of the Queen's bread, in the making of which yeast was used, and in the course of which the doctors, called in to give their opinion as to the effect of bread made with yeast on health, fell out, to the great delight of the author of the *Malades Imaginaires*. If, however, in all these times of trouble and of vexatious regulations, the poor journeyman baker was seldom at peace, at least he had the comfort of looking forward to the time when he might marry his master's daughter, and set up a shop for himself. But the poor journeyman bakers of to-day, who flit fretfully about in the twilight and in the dawn, have no such hope left. Capital, which they can never have an opportunity of amassing, is necessary to open a baker's shop, even now when the monopoly has been destroyed. Here he will remain where I see him now, on this bleak winter-night, in this stifling celler under the shop, with the red-hot mouth of the oven almost singeing his body, making and baking the bread of his fellow-man to the end of his short life. Little unbroken rest has he, even by day, for he must watch once or twice in the daytime the preparation for the night's batch of bread. The labor of kneading it is most unhealthy to him, driving the particles of flour into his lungs, and cannot be advantageous to the bread. Still, the Paris journeyman baker vehemently opposes the introduction of kneading machinery, in the fear that it will leave him to starve; and up to this moment he has been able to restrict the use of bread-making machinery within very narrow limits. Although his wages are low, and his hope of advancement is almost *nil*, he clings to the old system, albeit it must bring him to an early grave. The labor of a working-baker is so hard that apprentices to it are seldom entered younger than eighteen years of age. The apprenticeship lasts during a year or eighteen months, and the premium paid to the master-baker fluctuates between five and six pounds. At the expiration of this short apprenticeship, he becomes a brigadier. It is his duty to heat the oven, to put the bread in it, and remove it, and generally to exercise the functions of a foreman. In the bakery with him is the important workman called the first help. It is he who kneads the bread, sending forth, as from the bowels of the earth, the groans and piercing cries that affright the late-returning merry-makers. He shapes the dough into loaves, with the assistance of the second help.

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The first help earns about three-and-sixpence per diem; and his assistant has between half-a-crown and three shillings per diem. A fourth workman generally completes the staff of an ordinary Parisian bakery. This last is the drudge; he chops the wood, fetches the water, counts the loaves, and, in short, does all the needful drudgery, for something under two shillings per diem. The poor bakers are, I may observe, paid for overwork in this way. When they have to bake more than seven batches of bread, each batch containing seventy loaves, the workmen receive fivepence each for the eighth batch, and a penny each for the ninth. In addition to these money-payments, each workman is allowed to take away two pounds of bread daily, and it is this two-pound loaf that we have so often seen under his arm, as he trots away through the morning cold to his bed. He is allowed, moreover, to eat as much bread as he pleases during the night. There are indulgent masters, who give the poor fellows a sip of white wine before they start home in the morning; but these are, I fear, rare exceptions.—*Chamber's Journal.*

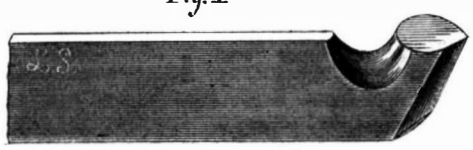
TURNING TOOLS.

PART FIRST.

There is no branch of the machinist's trade which is more interesting or important than that relating to the lathe and its management. Of two men working side by side with the same lathes, and on the same kind of work, the same feed and speed, one will do much more than the other. We see this exemplified on piece work. Here the earnings of the workman are exactly in proportion to his skill, and though his comrades may take every opportunity to discover the secret of his success, he still outstrips competitors.

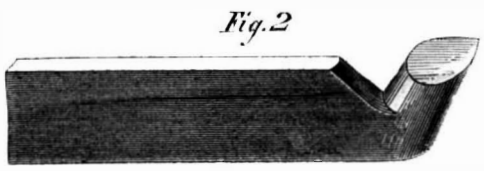
This is owing in most cases to the tools the skillful man works with. The unreflecting workman cannot appreciate some small matter in the construction of a tool, and suffers accordingly. He will most probably be contented to work with a clumsy tool, like the one shown in Fig. 1, instead of the more

Fig. 1



efficient one illustrated in Fig. 2, and he is perpetually wondering how it is that he is always behind hand.

Fig. 2



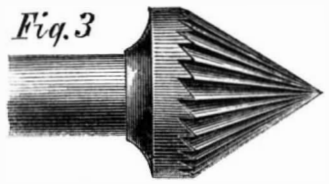
There is no mystery about the matter. A lathe tool works on one principle, as do all cutting instruments, and this principle is simply that of the wedge, as we have remarked in a previous article on boring tools, in the last volume of the Scientific American.

If a man has a heavy stone to raise, or a tough block of wood to split, he does not take a wedge which is thick and blunt, and almost as wide at the base as it is long. He uses instead a long, thin and easy one, which does the work with facility and celerity. The case is exactly the same when we cut iron or metals of any kind. To sever the fibers or crystals we must have sharp thin-edged tools, as thin as they can be made with economy. With these, and proper feed and speed, the work will be well done if intelligence superintend the operations. It is most essential that the tools be made sharp and kept so. If they are not, the work will be poorly executed. It is also of the first importance that the work be truly and properly centered. The center is the point on which the accuracy of the whole job depends, and it will be apparent to even the unprofessional reader that it should be perfect.

Very many workmen are content to take a center punch and make some sort of a cavity in the end of the rod, and "let it go at that," as the saying is. No good workman does this, but shiftless and indifferent ones do, and their work always shows badly compared with that done in a proper manner.

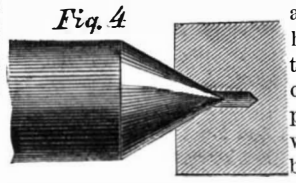
Every center should be drilled. The drill need not be larger than the tenth part of one inch, in ordinary work, and the object of drilling is to keep the point of the center in the lathe from bottoming. The centers in the work should be enlarged with a countersink, like the one shown in Fig. 3. But when the

Fig. 3



shaft is too heavy to be used in this way a square center is put in the place of the dead center of the lathe, a dog put on the shaft, and the job set revolving. The back end of a tool is then put in the tool post and screwed up tight, and the tool brought in contact with the running shaft. If the work has been drilled properly the sharp square corners make a countersink like the head of a screw, so that when the working center of the lathe is put in the spindle it will have a fair, solid bearing in the job, as shown in Fig. 4.

Fig. 4



The way a center, made with a center punch alone, acts, is shown in Fig. 5. Even if the punch is ground to an exact conformity with the lathe center, which is by no means likely, the center will not be true, as a rule, when the work is run over many times. For as the work revolves the orifice in the end of the shaft wears, where it bears on the lathe center. When the center comes to the bottom of the cavity, as it soon will, it stops there because its point can go no farther, while the larger or outer diameter of the centers wear away on the lathe center. This causes the work to be untrue; when a rough cut is taken off from the shaft and a finishing cut is to follow, the work runs "out," and not only spoils the looks of the job by leaving rough marks in one side, but ruins the work, for it is not round, and can never be made to fit in its place. There are many ways of making countersinks for enlarging centers. One commonly used, quite as efficient, and much cheaper than the former one, is shown in Fig. 6.

Fig. 5

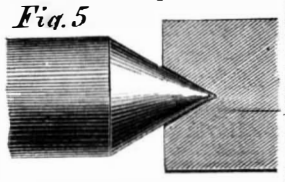
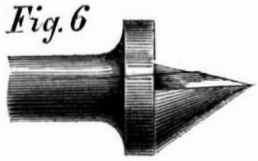


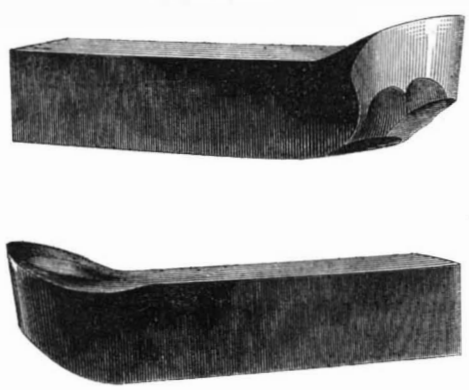
Fig. 6



Having thus made a brief but necessary digression from the subject of turning tools, let us resume the consideration of them.

The tool shown in Fig. 2, is a good roughing tool; it is called a diamond point, but there are very many turners who do not consider it the best for the purpose. It would be hard to say *why* precisely, for there is sometimes a great deal of whim exhibited in

Figs. 7 and 8.



the matter of tools. Men will use, in spite of argument or reason, the tools they have been in the habit of employing, and prefer them to all others, even when they know they are not so good.

The cutter shown in figures 7 and 8 is a most excellent one; its virtues have been well tried and not found wanting. It is stout, cuts well, when properly made, holds a good edge, and will carry a heavy or a light cut with equal facility. These are the chief requisites of a good roughing tool. The management of it depends on the workman.

EXPANSION OF STEAM.

To the Editors of the Scientific American:—

Gentlemen,—

As I see that in the Scientific American of the 15th of October, you make some reference to a work of mine, I beg leave to make the following remarks on the subject of your article.

The circumstances under which steam undergoes expansion may be classed under five heads:—I. When the steam expands without performing work. II. When it expands and performs work, the temperature being maintained constant by a supply of heat from without. III. When it expands and performs work, being supplied from without with just enough of heat to prevent any liquefaction of the steam, so that it is kept exactly at the saturation point. IV. When it expands and performs work in a non-conducting cylinder. V. When it expands and performs work in a conducting cylinder, not supplied with heat from without.

I. When steam expands without performing work (as in rushing out of a safety-valve or through a throttle-valve) it becomes superheated, as is well-known; the temperature falling very slightly in comparison with the boiling-point corresponding to the diminished pressure. The precise rate at which the temperature falls is not yet known; but it will probably be soon ascertained through some experiments by Prof. Thomson and Mr. Joule.

II. When steam expands and performs work, the temperature being maintained constant by supplying heat through the cylinder, the law of expansion at first deviates from Mariotte's law by the pressure falling *less rapidly* than the density; but as the expansion goes on, the law approaches more nearly to that of Marriotte, as recent experiments by Messrs. Fairbairn and Tate have shown.

III. When the steam expands and performs work, *being maintained exactly at the temperature of saturation*, the law of expansion, as you observe, is perfectly definite. In the treatise to which you have referred I have shown what it is; and also that it is expressed nearly enough for practical purposes by taking the pressure as being proportional to the 17th power of the 16th root of the density; a function very easily calculated by means of a table of squares and square roots. In many actual steam engines, the circumstances of this case are practically realized, as is shown by the agreement of their performance with the results of calculation

IV. When steam expands and performs work in a non-conducting cylinder, it was shown by Professor Clausius and myself, in 1850, that the lowering of the temperature, through the disappearance of heat in performing work, goes on more rapidly than the fall of the boiling point corresponding to the pressure, so that part of the steam is liquefied. This result was experimentally verified by Mr. G. A. Hirn, of Mulhouse, a few years afterwards (see his Treatise on the Mechanical Theory of Heat). The mathematical law of the expansion in this case can be given with perfect precision; but its circumstances are not accurately realized in practice, because the cylinder is always made of a rapidly-conducting material.

V. Lastly, when the steam expands and performs work in a conducting cylinder, which receives no supply of heat from without, but is left to undergo a great alternate rise and fall of temperature through its alternate connection with the boiler and the condenser, the law of expansion becomes very variable, and the problem of determining it extremely complex. It is certain, however, that a great waste of heat occurs in every case of this kind, as Mr. Isherwood's experiments have shown. In a paper read to the Institution of Engineers in Scotland, about two years ago, I discussed some of Mr. Isherwood's earlier experiments, and showed that they gave proof of a waste of heat increasing with the fall of temperature due to the expansion of the steam, with the extent of conducting surface of the cylinder, and with the duration of the contact between the hot boiler steam and that conducting surface.

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As to the value of indicator-diagrams, I have always held that they gave a good approximation to the whole *work done* by the steam during each stroke, though not to the pressures at particular instants, which, in ordinary indicators, are affected by oscillations and other disturbing causes; but that defect I consider to be nearly, if not entirely, overcome in the indicator of Mr. Richards; and I hope for very valuable results from the extension of its use.

W. J. Macquorn Rankine.

Glasgow University, Nov. 18th, 1864.

SEASONING OF LUMBER AND TIMBER.

[For the Scientific American.]

It is evident that the seasoning and drying of lumber is not properly understood by the community. If there ever was a time in which the best mode was needed it is now. Every manufacturing establishment in the country is taxed to its utmost capacity, and must, for years to come, to supply the demand for buildings, carriages, wagons, reapers and mowers, rail cars, bridges, sash blinds and doors, cabinet, cooper, chair, tub and rail, and other work, with gun carriages, gun stocks, pianos, melodeons, organs, ships, etc., all of which require seasoned lumber.

The question is, how can this seasoned lumber be obtained, when the demand for lumber follows close to the saw? Indeed, it is very difficult to manufacture lumber as rapidly as it is needed for immediate use.

Four years in the open air is none too much time to prepare even two-inch lumber for good work. Oak lumber, such as is used for gun carriages, car sills, etc., will not be properly seasoned by an exposure to the air for ten years, while a large portion of it will be destroyed by eramacausis, or dry rot, long before that time. I have extracted at the rate of over 600 pounds per M feet, board measure, from this kind of lumber that had been dried under cover 19 years, and, at the same time caused a shrinkage in its size of $\frac{1}{4}$ inch to the foot.

I have made the seasoning and drying of lumber a study for more than eighteen years, and I now propose to make a few suggestions, in a sufficiently brief manner to come within the rule of brevity which you have adopted, and if the matter is not sufficiently explicit for your readers I will answer inquiries by mail.

To season lumber is to coagulate its vegetable albumen, and render it insoluble in cold water. Lumber may be seasoned and not dried, and dried and not seasoned. It requires both to be perfect.

All wood contains albumen more or less. This albumen is precisely like the albumen of the egg, except a trace of sulphur in the egg. If this albumen is simply dried in the air it will shrink and swell with every change of atmosphere. Common air drying will never fix albumen, nor will it in any length of time perform the most thorough shrinkage. Cold water, hot air, and steam may extract albumen, and the air may do the drying. But all lumber and timber is injured in its strength and in its beauty of finish by the loss of its albumen. The albumen properly coagulated and left in the pores of the lumber is as valuable as paint or varnish for its preservation or beauty of finish. Besides, no lumber that has lost its albumen by soaking or steaming can ever be reduced by air drying to its smallest possible size, since the air dries the outside first and forms an enamel that will not further shrink when the inside becomes dry. It must all shrink together, in order to make the lumber solid for a fine finish. If the pores of the lumber are dried open it cannot make a good finish.

Now, what seems to be desirable, is, to be able to put a tree in the forest, manufacture the lumber, season it thoroughly, dry it sufficiently to reduce it to its smallest possible size, and be able to manufacture it into anything, from a clothes-pin to a ship, during the same week it is taken from the stump.

I have discovered precisely such a mode, and can now direct or show any one, so that they can have better seasoned lumber in a week than they can make in the air in a week of years. And what is still more surprising, it has the following rare combination of qualities, to wit: greater rapidity, more thorough seasoning and drying, and cheaper than any other process known to science, whether natural or artificial. If needs be, the whole may be creosoted for its preservation, at the same time, and at a merely nominal expense.

The process is simply the use of superheated steam—superheated in particles, or one particle at a time—and used in a moderately tight room, requiring no more pressure than simply to balance the atmosphere and exclude the air. This steam may be made from the moisture of the drying substance, or in any other cheap and convenient way, to be used in the place of air for conveying caloric to the substances to be seasoned or dried. This steam also keeps the pores of the lumber open, penetrates to the center without forming an enamel on the outside, and when the whole is sufficiently hot the lumber is not only seasoned, but the drying commences at the center, which is the last place reached by any other mode of drying, if, indeed, it is ever reached at all by such modes. Besides, steam has 90 times the power of motion and absorption that common air has. Steam also holds 1,000 degrees of latent heat, which assists in preventing waste of fuel. When this process is properly arranged and managed there is scarce a possibility of any escape of heat, unless it be in the steam generated from the drying lumber, and which only passes out when it is in excess in the drying room. It will, therefore, readily be seen that lumber which is continually surrounded by such a steam atmosphere cannot be dried in one part more rapidly than it can in another, and must shrink alike.

By this process the shrinking of the lumber is all done before the lumber is entirely dry, and the more moisture there can be left in any lumber, after the seasoning and shrinking are completed, the stronger, tougher, and more durable the timber. This process, therefore, is capable of seasoning and shrinking the lumber, and still leave more moisture in it, or it may leave it drier than any other mode.

Having already expended nearly $200,000 in experiments with this new principle of seasoning and drying lumber, grain, flour, meal, fruit, vegetables, tobacco, salt, wool, flax, etc., I should be pleased, if I had the time and room, to give you the result of experiments with each, such as the drying of flax in an hour directly from the water-rotting tank, so that it will dress better in any machine than by air-drying any length of time, but this article would soon be too long to come within the sensible rule of brevity established by the Scientific American.

H. G. Bulkley.

Cleveland, Ohio. Dec. 14, 1864.

Water Engines in Europe.

Messrs. Editors:—I notice in your last issue a reply of yours to a correspondent, saying that you see no reason why water should not be made to act by ~~direct~~ pressure. and that there existed such an engine in Washington. Lest your correspondent should go to all the trouble, work and expense of re-inventing this motive power, I wish to inform him, through your columns, that there are dozens of these engines in operation in Germany, Belgium, France and England, and that I for one have the drawings of several kinds of these water column engines as they are called. I have also seen one in operation; this was near Berchtesgaden, Bavaria, in the salt mines. This engine had been running continually, with hardly any repairs, for over thirty years, with only one and the same old man to attend to it all that time. It was used to pump the brine over a hill of several hundred feet in hight. As engines of this sort work neeessarily very slowly, only three or four strokes per minute, they are peculiarly adapted for driving pumps, for which work they are considered the best motive power when there is a sufficient fall of water on hand to drive them, and so far they have been used for that purpose only.

Clemens Herschel, C.E.

No. 6 Joy's Buildings, Boston, Mass.

Work on Cotton Spinning Wanted.

Messrs. Editors.—Please to inform me of the best work on the practical operation of cotton machinery. I have a work entitled the "American Cotton Spinner," but it does not explain the point I wish to understand, which is:—Suppose a man was about to start a mill; he wishes to produce cloth that shall weigh four, five or six yards to the pound, that will require a certain number of yarn according to the sley and pick of the goods. Now, what weight of cotton shall be spread on a given space on the lapper apron, so that after it has passed through the different machines with whatever draught they may have, the result shall be the number of yarn required? If you know of any work thorough enough to explain those points, please to inform me. J. H. H.

[Perhaps some of the cotton spinners among our readers will answer this.—Eds.

An Iron Letter by Post.

The Birmingham correspondent of the London, *Engineer* says :—

"An original specimen of iron-rolling was placed in the Midland Institute, in Birmingham, by the proprietors of the *Birmingham Journal and Post.* It is no other than a letter written upon iron, rolled so thin that the sheet is only twice the weight of a sheet of ordinary-sized note paper of the same surface dimensions. It weighs two pennyweights and twenty one grains. Tested by one of Holtzappfel's gages, the thickness of the sheet is found to be one-thousandth part of an inch. A sheet of Belgian iron, supposed, hitherto, to be the thinnest previously rolled, is the six hundred and sixty-sixth part of an inch thick ; and the thickness of an ordinary sheet of note paper is about the four hundredth part of an inch. The letter, which is dated, 'South Pittsburgh, Pa., November 6, 1864,' explains the object of the manufacturer. It runs thus:—'*To the Editor of the Birmingham Journal*—Sir : In the number of your paper dated October 1, 1864, is an article setting forth that John Brown & Co., of the Atlas Works, Sheffield, has succeeded in rolling a plate of iron 7 feet long, 6 feet wide, and 13½ inches thick. I believe that to be the thickest plate ever rolled. I send you this specimen of iron made at the Sligo Ironworks, Pittsburgh, Pa., as the thinnest iron ever rolled in the world up to this time, which iron I challenge all England to surpass for strength and tenacity. This, I believe, will be the first iron letter that ever crossed the Atlantic ocean; and if you should think it worthy of notice in your widely-circulated paper, please send me a copy of the same.—Yours, &c., John C. Evans.' Fourteen years ago some iron was rolled very thin at the Bankfield Ironworks, Bilston, and afterwards bound up as a book ; and previously to the rolling of the Belgian iron referred to above, and shown at the Exhibition in 1863, it was the thinnest iron which, up to that time, was supposed to have been rolled, for it was only a little thicker than ordinary note paper, but it could not compare with the specimen which our American friends have turned out."

The Patent Stone Bricks.

At a recent meeting of the South Wales Institute of Engineers, Capt. J. J. Bodmer read a paper "On the Nature and Manufacture of Patent Stone Bricks." The writer described the process adopted by Messrs. Bodmer Brothers, Newport, in the manufacture of the patent stone bricks. When they considered that labor was now about 100 per cent. higher than it was about eighty years since, anything which tended to lower the price of so useful and general a commodity as bricks, must be considered a timely invention. The stone bricks, he said, had fulfilled these requisites. Another very great advantage which these stone bricks had over the common bricks was, that they improved by age; whereas the common bricks skinned and deteriorated. Some of the bricks were exhibited to the members. Some had been made of Aberthawe lime and sand; others of sand and cinders; and some others had been made out of slags, which were particularly hard and durable. Some of the bricks made by the patent process were stated to have borne a weight of three tuns per brick, after having been made but fourteen days; others, which had been longer made, were capable of bearing about thirty tuns per brick. The chief difficulty in the manufacture was that of reducing the material employed to the fineness of sand, or, better, to that of powder.

A Mr, Alex. Cuthell, of Doncaster, England, sends a tracing of a slide valve and cut off to the *Engineer*, said cut off being operated by the governor. The arrangement is not new, having been used in "Boyden's" engine in this country for many years.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Shaft Coupling.—This invention relates to a new and improved coupling for shafting, and it consists in the employment or use of a divided collar, provided with one or more screws or screw threads and conical surfaces on its exterior, in connection with nuts and female cones, or thimbles having conical interiors to work on, the conical surfaces of the divided collar all being arranged in such a manner that shafting may be securely connected with the greatest facility, and also secured together in line, one shaft with another, thereby avoiding much trouble hitherto experienced in putting up the shafting of machinery. James P. Collins, of Troy, N. Y., is the inventor.

Turning Machine.—The object of this invention is an improvement in that class of machines which are intended to turn automatically conical or other articles of a regular or irregular form, and of variable diameter. The invention consists in the application for the purpose of feeding the stuff to be turned of a screw-thread cut in the guide, either in front or behind the roughing-out tool, in such a manner that the stuff on entering the guide will work into said screw-thread, and by its action will be fed to the tool for a distance corresponding to the pitch of the thread, at each revolution which it makes, and a quick, automatic and uniform feed is effected. It consists further in the use of a forked guide made to straddle the roughing-out tool, and to spring open in such a manner that the stuff is securely guided on both sides of said tool, and by throwing the jaws of the guide open any impurities lodging in the guide holes can be readily removed, and when the jaws are closed upon the stuff the feed screw bites into the surface of the same, and causes it to be fed without further attention of the operator or attendant. It consists further in the employment of a rotating cam acting on the slide rest, in which the finishing tool is secured in such a manner that by the action of the said rotating cam the motions of the finishing tool and the shape of the article to be turned is governed. Finally, in securing the cutting-off tool in a sliding head, rendered yielding by the action of a spring, in such manner that said cutting-off tool is enabled to act, while the stuff is continually fed along by the action of the feed screw. Chas. G. Bloomer, of Wilkford, R. I., is the inventor.

Match Machine.—This invention consists in the employment or use of one or more hoppers filled with cards, in combination with a suitable feed apparatus and set of knives, in such a manner that one card after another is taken from the hopper automatically and exposed to the action of the knives, to be cut up in single strips of the requisite thickness; also in taking the cards from the bottom of the hopper or hoppers, so that the same by their inherent gravity are brought in the requisite position to be fed to the knives, until the hoppers ars exhausted; further, in arranging the knives in sections, separated from each other by suitable intervals so that each card is cut up separate, and the match stick so cut can be easily kept in separate tiers, and the feeding to the rack is facilitated; also, in the use of guides in front of the knives, and placed opposite the intervals between the several sections, to keep the match sticks in separate distinct tiers; further, in the employment or use of a rack, to which an intermittent motion is imparted, in combination with the guides, the knives and the feed apparatus, in such a manner that one tier of matches after the other is automatically pushed between the slats of the rack, as the same arrive successively in a position opposite the table; also in the application to the slats of two or more elastic bands or springs placed round said slats, at suitable intervals, in such manner that they hold the same together with a yielding pressure, and the frames are enabled to hold the match sticks, and to accommodate themselves to sticks of different size and thickness; finally, in subjecting the match sticks, after they have been passed between the slats of the rack, to the action of combs or other suitable device, in such manner that the same are automatically slipped, or, in other words, that the alternate sticks are pushed out in opposite directions, to keep their ends separate while dipping. Emory Andrews, of Springfield, Mass., and Wm. Tucker, of Uxbridge, Mass., are the inventors.

Wind Wheel.—The object of this invention is to obtain a cheap, safe, and reliable mechanism for obtaining power from the wind, designed more especially for driving light machinery for household or domestic purposes, such as churns, washing machines, grind-stones, wood-sawing machines, etc. The invention consists in combining with a wind wheel, of novel construction, a mechanism provided with a weight; all being arranged in such a manner that the wind wheel, when in operation may raise the weight, and render the mechanism aforesaid available as a motor which may be used when there is no wind and the wind wheel consequently inoperative. Robert S. Smith, of Stockport, N. Y., is the inventor.

Railroads.—This invention relates to a new and useful improvement in what are generally termed sheet railroads, and it consists in constructing the rails with indentations in their edges, so as to form a series of short inclined planes at both sides of each rail to enable the wheels of common vehicles to release themselves from the track or pass over the rails when approaching them obliquely. Great difficulty is now experienced in getting the wheels of common vehicles over the rails, when presented obliquely to them, and when the wheels are inside of the rails they are frequently materially injured and strained in crossing the latter, in consequence of the barrier the rails present to them. A difficulty which is fully obviated by this invention. Theodore M. Schleir, of Nashville, Tenn., is the inventor.

Casks.—This invention relates first, to a means employed for preventing the cask being injured by the removal of the bung. The ordinary wooden bung, as is well-known, requires to be started or loosened by striking the stave in which it is fitted by means of a mallet or hammer, and this operation after beiug repeatedly performed injures and breaks or splits the stave. To obviate this difficulty is one of the objects of this invention, and to effect such result a portion of the stave in which the bung is fitted is constructed of metal, and fitted between the wooden parts in a firm and substantial manner. The invention relates, second, to an improved means employed for applying a faucet to the cask, whereby the former may be inserted in the head of the latter, with the greatest facility and without the slightest danger of the escape of any portion of the liquid contents of the cask or gases contained therein. Frederick Acker, of San Francisco, Cal., is the inventor.

Steam-Engine Governor—This invention consists in a spindle furnished with spiral blades or wings rotating in a cylinder containing oil or other liquid, and a spring or weight applied to the said spindle to press it longitudinally in one direction. The pressure of the faces of the blades against the liquid caused by their revolution, tends to produce a longitudinal movement of the spindle in the opposite direction to the pressure of the spring, such tendency being greater or less according to the velocity of revolution, and the spindle being connected with the regulator of the engine or motor, its longitudinal movement is made the means of operating upon the regulator to govern the movement of the engine or motor. J. T. Rich, Rahway, N. J., is the inventor.

How Magnesium is Made.

The process by which Mr. Sonstadt produces the metal is as simple as it is ingenious. The lumps of the carbonate of magnesia are placed in large earthen jars with a quantity of muriatic acid. The solution thus obtained is drawn off when clear, and mixed with a solution of chloride of sodium, or potassium. This mixture of magnesium and the alkaline chlorides is subjected to heat in porcelain basins until the moisture is evaporated. The dried mass remaining is fused in a platinum crucible, and when poured out is technically known as "material." To deal with this a furnace is required, and the aid of sodium, which has already enabled chemists to obtain one of the latest metalllic contributions to civilization—namely, aluminum. So important is the part played by sodium, that upon its price almost entirely depends the cost of magnesium. To make the latter cheap enough to be generally useful, it will be necessary to discover some less expensive mode than the present of obtaining sodium, and that it is to be hoped will be done shortly. The material is submitted to heat in an iron crucible to liberate the magnesium. The metal thus obtained is still unfit for commerce, being brittle and unworkable. It is purified by distillation in closed vessels, somewhat upon the principle of mercury distillation from cinnabar. The finished metal is brought into the form of wire, in which state it has alone been used hitherto, by forcing through a small orifice by hydraulic pressure. Inasmuch as sodium and magnesium are not unfrequently found in sea water in proportion which would not be inconvenient in the manufacture of magnesium, it is to be hoped that at no distant period a mode of extracting the double chloride from the water direct will be discovered, for there can be no doubt that if cheap, a variety of purposes to which the metal could be applied would speedily be discovered.—*London Mining Journal.*

Manufacture of Aluminum.

The alkaline metals have hitherto been considered the only agents for reducing the chlorides of aluminum, but Mr. N. Basset, of Paris, has discovered that the metalloids and metals which by double decomposition will form chlorides more fusible and volatile than the chlorides of aluminum may be employed for reducing these latter. For instance—arsenic, boron, cyanogen, zinc, antimony, mercury, and even tin, may be used, and also the amalgams of zinc, antimony and tin. The inventor prefers to use zinc, owing to its low price, its facility of application, its volatility, and other useful properties. The zinc should always be added in excess in the proportion of, say, four of zinc to one of chloride of aluminum. When this latter is brought into the presence of zinc at a temperature of from 250° to 300° centigrade, a chloride of zinc and free aluminum is obtained. This latter will dissolve in the excess of zinc, and the chloride of zinc combining with the chloride of sodium, the mass becomes thick or pasty, and then solid, while the alloy of zinc and aluminum remains liquid. If the temperature of the mass is again raised it all becomes liquid again, and the zinc reduces another proportion of chloride, and the excess of zinc becomes enriched with an extra quantity of aluminum. The rich alloy is again melted with the addition of more chloride of aluminum, and kept well stirred or agitated, until nearly pure aluminum, with only a small per centage of zinc, is obtained. This is again melted at nearly a white heat, until the remaining zinc is volatilized, and pure aluminum remains.

LIBRARIES FOR SOIDIERS IN THE FIELD.—A laudable enterprise has just been undertaken by the Christian Commission and is being practically carried out, viz:—to provide libraries for our soldiers in the field. In order to secure 300,000 volumes of good choice books every friend at home is asked to purchase and send one or more to the Christian Commission as a New Year's gift to the soldiers. They will be assorted and forwarded to the proper quarters under the care of the agents of the Commission.

AN IMMENSE telescope has just been completed for the Chicago University. The object glass is worth $11,187, and required two years for its completion, by Mr. Alvan Clark, of Cambridge, Mass. The telescope weighs 6,000 pounds, the length of the great tube being eighteen feet, and the magnifying power ranging from eighty to eighteen hundred. The entire cost of the instrument was $18,187; the cost of the observatory $25,000.

A DENTIST wishes the press to correct the statement, made on Horace Walpole's authority, that alum is a preservative of the teeth. He says it is on the contrary one of the most destructive agents with which the teeth can come in contact.

ECLIPSES.—Next year there will be four eclipses—two of the sun and two of the moon. The eclipses of the sun occur on the 25th of April and the 15th of October; those of the moon on the 11th of April and the 3d of October.

The British war corvette *Scout* has been selected by the Admiralty to have her midship sides protected by means of chain cable, in a plan similar to that adopted by the United States steamer *Kearsarge*, when in action with the *Alabama*.

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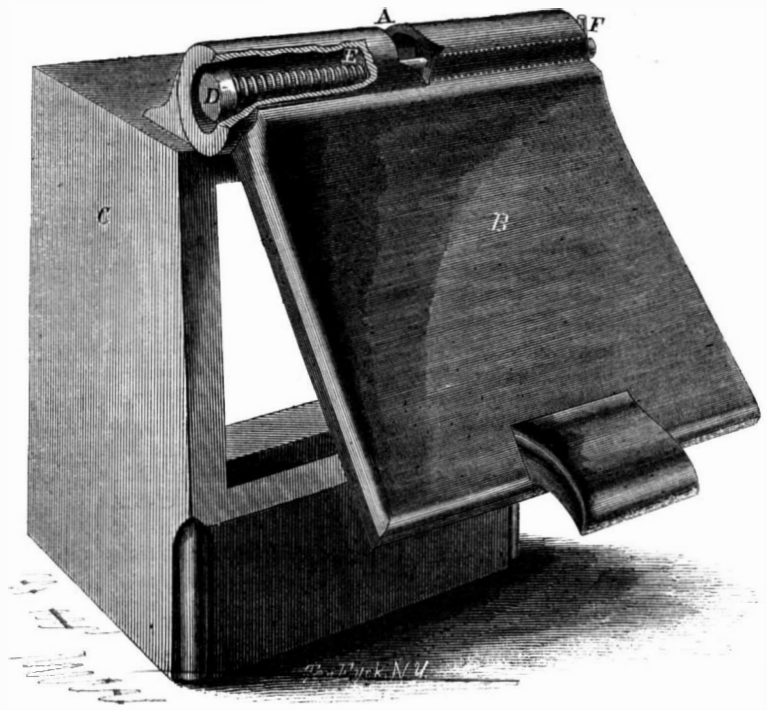
Improved Axle Box.

The common axle boxes in use on railways are very inconvenient things, as regards the covers. On most of them a screw wrench must be used before they can be oiled. These screws are continually jarring out, or breaking off, so that the covers are lost on the road, and have to be renewed very often. In the box here shown no screws are employed, the casting being solid and the cover kept down by a cam-shaped hinged joint, A. This joint is halved in the center, one wing being on the cover, B, and the other on the box, C. A bolt, D, having a spring, E, slipped over it, fits the projection on the box, and by means of a pin, F, in the opposite end, draws the cover up to the box and holds it fast in either position, open or closed. The cover is shown partly raised in the engraving, and the lug on the box is broken out to expose the springs. This is a very useful improvement, as it is durable, efficient and free from the objections which attach to screws. A patent is ordered to issue on it through the Scientific American Patent Agency, by S. T. Shelley, of Louisville, Ky.; for further information address him at that place.



SHELLEY'S AXLE BOX.

THE RUHMKORFF COIL.

On the 23d of February 1852, the Emperor of the French offered a prize of 50,000 francs to be bestowed, after five years, to the author of the most important discovery concerning the applications of electricity, and a commission, composed of thirteen of the most eminent men of science in France, was appointed to award the prize. In 1857, the commission reported that they had not judged any discovery sufficiently eminent to receive the large reward, and prayed that the time might be extended for five years more. The last number of *L'Invention* contains a long report of the Commission, signed by M. Dumas, the President, awarding the prize to M. Ruhmkorff, the inventor of Ruhmkorff's coil.

The report says, "M. Ruhmkorff was a workman for some of our best constructors of instruments of precision, and finally chief, in his turn, of a house, the celebrity of which increases and extends each year. His education was made little by little, by reflection, by the study of a few books meditated without ceasing, and by the lessons of a few professors, heard, as it were, by stealth, at very rare hours of leisure. Modest in his life, of a perseverance which nothing could distract, of an abnegation which merits the most illustrious testimonials of esteem, M. Ruhmkorff will remain as a type worthy to serve as a model to those numerous intelligent workmen who people the workshops of precision of the capital."

As we have recently promised to a correspondent an explanation of the Ruhmkorff coil, we will give it in this connection. If two wires are placed parallel and near each other, and a current of electricity from a galvanic battery is passed through one of them, at the instant when the current commences there is a momentary current through the other wire in the same direction. This secondary or induced current immediately ceases, although the primary current is continued. But if the primary current is broken, another wave passes through the parallel wire but in the opposite direction.

If the wire for the primary current is wound in the form of a helix, and a finer wire, properly insulated, is wound in a second helix around the first, the force of the induced current is greatly increased.

All of these facts were discovered by others than Ruhmkorff; his invention consists in a device for breaking and renewing the primary current automatically, so that the machine would give a succession of induced waves through the outer helix without any manipulation. His plan is exceedingly simple. He cuts the primary wire and attaches to one of the cut ends a hammer of soft iron, which rests upon an anvil connected with the other cut end. Thus the circuit is closed, but can be broken by raising the hammer. He now places in the axis of the helix a bundle of soft iron wires, with their ends just over the hammer. When a current of electricity is sent through the helix, it makes the wires magnetic, and the hammer is attracted upward; breaking the current. On the breaking of the current, the wires cease to be magnetic, and the hammer falls; again closing the circuit. When the machine is properly constructed the current is thus automatically broken and closed several hundred times in a minute.

The induced current of the Ruhmkorff coil combines the large quantity of galvanic with the high intensity of frictional electricity, and in this consists its value for many scientific and industrial purposes.

SQUIRE'S FRUIT JAR.

During the last summer articles on preserving fruit

were published in the Scientific American which pointed out defects in the present jars, and hinted at improvements which would make them much better The jar here illustrated is, we are assured by th inventor, one result of our suggestions, and othe readers may take the hint thus thrown out, and ac upon it with advantage to themselves.

This jar provides against any cavity or space above the fruit. It is well known to all practical persons that heat expands the bulk of the fruit so that when cold the contents shrink and leave a space above which is detrimental. Mold accumulates on the top of the fruit and destroys its commercial value as well as the flavor. To provide against this defect the jar must be filled, as the fruit shrinks, with sirup, so that when at a moderate temperature no cavity will exist.

The method of doing this will be understood by perusing the description. The fruit is first scalded, or not, as desirable, and put in the jar; after which the cap, A, is pushed down to its place. There is a rubber gasket between the cap and the jar, so contrived that the fruit does not come in contact with it, which makes an air tight joint between the two glass surfaces. The fruit in the jar is then brought to the boiling point by being placed in a common boiler heated gradually. The fixed air remaining in the jar is expelled through the small hole, B; and the clamp, C, which works on a strong glass stud, D, is shifted round until the holes are covered; the clamp has a rubber ring, E, slipped over it, which keeps the surfaces below it air tight, and its ends work in a scroll groove in the neck of the jar. The jar is then removed, and as the contents fall by shrinking, additional sirup is poured in through one of the orifices, the air within escaping by the other. In this way the jars are filled to the very top, and no mold accumulates.

Another good feature in this jar is the application of the points, E, to the bottom. All persons who have canned fruit must have noticed a propensity in the jars to upset when the water surrounding them boils. This is occasioned by the confined air under the bottoms which, in seeking to escape, oversets the jar unless care be taken to prevent it. The jars are also frequently broken at the bottom from being taken out and set on colder surfaces, the difference in temperature cracking the glass quickly. Both of these defects are obviated in this jar, for the space beneath allows the air to escape, and the slight surface presented by the points permits the vessel to be set any where with impunity; they also strengthen the bottom.

The combination of these several features should make a most excellent fruit jar, and we predict for it a large sale when its virtues become known. It was patented through the Scientific American Patent Agency, on Oct. 18th, 1864, by John J. Squire, of Windsor Locks, Conn. For further information address him at that place.

NOTICE TO SUBSCRIBERS.

Hereafter, until further notice, the price of the Scientific American will be as follows:—When sent by mail, $3 per annum; $1 50 for six months; $1 for four months. When delivered in the city by carriers, $4 per annum. Single copies at the publication office and at periodical stores, 8 cents each. The postage on the paper by mail is 20 cents a year, payable quarterly in advance at the post office where received.

The Hecker and Waterman Experiments.

It will be remembered that to complete the programme laid out by Mr. Waterman at the commencement of his experiments, one series of 4 experiments of 30 hours each was yet wanting. There has been a delay in repairing the engine before completing this series, but we learn from Mr. Waterman that the engine is now in order, and that the experiments will soon be finished.

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WHAT CAN BE DONE FOR INVENTORS.—ADVICE GRATIS AND ADVICE FOR PAY.

For the information of Inventors, we would state that it is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability, without charge. Persons having made what they consider improvements in any branch of machinery, and contemplate securing the same by Letters Patent, are advised to send a sketch or model of it to this office. An examination will be made and an answer returned by early mail. Through our Branch Office, located directly opposite the Patent Office in Washington, we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor most reliable advice as to the probabilities of his obtaining a patent, and also as to the extent of the claim that it is expedient to set up when the papers for an application are prepared. For this special examination at the Patent Office we make a charge of Five Dollars. It is necessary that a model or drawing and a description of the invention should accompany the remittance.

The publishers of this paper have been engaged in procuring patents for the past eighteen years, during which time they have acted as Attorneys for more than TWENTY THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

Pamphlets of instructions as to the best mode of obtaining patents in this and all foreign countries are furnished free on application.

For further particulars as to what can be done for inventors at this office, see advertisement on another page, or address

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BREECH-LOADERS TO BE ADOPTED.—The Government has appointed a commission of seven military officers, to meet at Springfield Armory on the 4th of January, for the purpose of testing breech-loading carbines and muskets, in order to select the best for army use.

PROFESSOR RANKINE ON EXPANSION.

We have the pleasure of laying before our readers in this number a communication on Expansion, from W. J. Macquorn Rankine, LL.D., of Glasgow University. Among the eminent masters of science, the two who have probably devoted most labor to the study of steam, are Regnault, of France, and Rankine, of Scotland; and there can be no higher authority on all questions relating to this department of physics than Professor Rankine. In this communication, the effects produced on the temperature and tension of steam by its expansion under various conditions are most clearly and distinctly stated.

It will be seen, that Professor Rankine says that steam, in expanding, without doing work, is slightly superheated; thus ratifying our reasoning on this point, and contradicting the conclusions of Mr. Isherwood in regard to condensation from "expansion *per se*."

In going over so much gronnd in a short newspaper article, of course it was necessary to condense the several statements to the utmost, and while we admire the terseness, we cannot help wishing for a fuller discussion of some of the positions. From some of Mr. Tyndall's remarks we should suppose that he would take the ground that steam in escaping through a safety-valve performs precisely the same amount of work, in disturbing the atmosphere and in other ways, that it does when it pushes a piston before it in a loaded engine. But Professor Rankine says that in the former case it does no work, and is superheated, while in the latter, it performs work, and is partly condensed.

In Mr. Isherwood's experiments, as well as in those of Messrs. Hecker and Waterman, it was found that from 8 to 45 per cent. of the steam was condensed in the cylinder, without doing work. This condensation takes place even when the cylinder is surrounded by a jacket of hot steam, the cooling not being effected by the conduction of heat through the walls of the cylinder, but by the abstraction of heat from the interior surface, in re-evaporating, during the exhaust, the water formed by condensation during the previous stroke. Should the fact of this large condensation be confirmed by other observers, it will be a very important matter to be taken into account in the practical application of Professor Rankine's principles to working engines.

Ought this condensation to be considered, or ought it not, in the third case cited by Professor Rankine, where steam expands and performs work, being maintained exactly at the temperature of saturation? It is said that the circumstances of this case are practically realized in many actual steam engines, as is shown by the agreement of their performance with the results of calculation. Though the performance of the engine agrees with the calculated power of the steam operating in the cylinder, what would be the agreement if the calculation was based on the whole quantity of steam formed in the boiler?

It was from the assumed disturbance of the pressure in the cylinder of a steam engine by this condensation and re-evaporation, that we supposed this instrument fails to furnish data for determining the *theory* of expansion. Though indicator diagrams give a good approximation to the whole *work done*, if from 8 to 45 per cent of the steam is condensed without doing work, the work done is not a very close approximation to that which the whole of the steam would perform if it were all utilized.

The occurrence, however, of this large condensation needs confirmation by other observers before it can be accepted as fully established.

In the mean time, it is exceedingly satisfactory to have the world's present knowledge of steam so briefly and distinctly set forth. Steam in expanding without doing work is superheated, and when Messrs. Joule and Thompson have ascertained the rate of superheating, we shall have a complete theory of expansion, which will supersede the calculations based on the Mariotte law and the hyperbolic curve.

COPPER IN SPAIN.—M. Tribaut, a French mining engineer, has lately discovered a very rich vein of cobaltiferous copper, containing nearly 9 per cent. of oxide of Cobalt, near Oviedo, in Spain. He has entered into an agreement with an English house to take nearly the whole produce of his mines.

RETROSPECTIVE.

There is nothing more illustrative of the national energy and genius than the indomitable spirit exhibited under adverse circumstances. If in any other country than our beloved America a faction should arise and threaten the national existence, the plow would stand idle in the furrow, the threads of the loom swing listlessly from the frames, the anvils clink only to the sharpening of swords. The arts have not languished with us though the war still goes on. No very great inventions have been introduced during the past twelve months, but in that time old ones have been well tried and not found wanting.

The turret system for iron-clad vessels of war, against which so much has been written, has proved itself of paramount importance, and signal victories have been gained over our enemies through its adoption.

The utilization of the products of combustion, as applied to air engines, has been perfected in Roper's machine, and a very useful addition made to the list of prime movers.

In the matter of working heavy guns on shipboard we have great superiority over foreign powers. Two men can now handle a 20-tun gun, or heavier, with as much ease as a field piece in battery is maneuvered, and that though the ship be rolling at any angle. When a gunner can stand on his feet, these huge cannon can be worked. The system is the invention of Capt. John Ericsson, and patents were taken out on it through this office.

In the beautiful art of photography some progress has been made during the past year. The distinguishing improvements relate to the printing process. Mr. Swan, of England, has brought to great perfection the plan of carbon printing, by which the salts of silver are wholly discarded. Pictures superior in artistic effect to the silver prints, more permanent, cheaper, and capable of greater variety of tint and tone, are thus produced. Another improvement which has attracted much attention is that of Wothly, of Germany. He prepares the paper for printing by pouring upon its surface a collodion which contains a few grains of the salts of uranium, and also of silver. Very beautiful pictures are made on this paper, and some of the inconveniences of the ordinary method of silver printing are overcome. Both of the above improvements have been fully set forth in our columns.

The extension of the electric telegraph over Russian America, binding it to this country, although not an invention, is one of those great enterprizes which will open up new countries to the influence of civilization, and tend to dissipate ignorance, the twin brother of barbarism.

New textile fabrics are being experimented with; new substances for paper making are being tried, but come into use slowly, although manifestly economical and valuable.

In the art of war, very much has been done, and is doing, to render our nation superior to all others. Cannon of large caliber have been introduced, and are making way, in spite of the obstacles thrown in their path by learned and unlearned. Submarine warfare, as relates to the use of torpedoes, has also been experimented with, and the gallant achievement of Lieut. Cushing, with Chief Engineer Wood's apparatus, is an evidence that practical results can be obtained.

The adoption of breech-loading small arms to a considerable extent is also a desirable conclusion arrived at, and the experiments with wrought-iron cannon now in progress will doubtless end in the adoption of them for certain purposes. In hooped ordnance we have the Parrott gun, of which the Chief of Ordnance says that it has proved itself to be a most excellent weapon, superior in general to all others.

The development of petroleum has attracted the greatest attention during the past twelve months, and has become an established industry. The geographical extent of the country in which petroleum is found is known positively to be of immense area. Much value will always attach to it as a staple article.

Of minor inventions the number and character are too great for special mention. The list of patent claims, published weekly in this journal, affords convincing proof that inventors are not idle. There are many things which will never become celebrated in the world that now employ hundreds of tuns of iron

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and thousands of dollars of capital in their production.

OIL STOCK EXCITEMENT.

Nothing in the history of this country, if we except the furor that followed the opening of the gold fields of California, has caused so much excitement in business circles as the rapid development of the petroleum oil interests. There are oil stock exchanges, oil stock journals, and all the other appliances of regular commercial and financial operations. Oil cities even have sprung into existence, and speculation is running up to fever heat; hundreds of Joint Stock Companies have been organized, and a still larger number are now rapidly organizing. Thousands of persons are being allured to invest their money in the stocks of these companies under the stimulus of promises of large dividends.

Now, although there is much substantial merit in the oil well productions of the country, and it is true that there are many really substantial Companies, it behooves those who are infected with the oil fever, to be extremely cautious how they invest their money, or they will surely suffer loss.

Most of the Companies now organized have a nominal capital stock far exceeding the actual investment. Purchasers are attracted towards them by the magnetic newspaper puff, and by rose colored prospectuses they are led to expect results which, in many cases, can never be realized. To illustrate how these Joint Stock Companies are sprung upon the credulous public, we will give an example. A few individuals get control of a patch of land located somewhere in the oil region—land secured under excitement and at speculative prices. The amount promised to be paid for the property we will assume to be $100,000, a portion of which will be taken by the original owner in stock; with a reserved working capital of $25,000 additional. Upon this basis a stock scheme of $500,000 is predicated, and all the enginery well known to the getters up of Stock Companies—for it is a profession now-a-days—is set in full tide of operation. Large commissions are paid to friends to forward the scheme by stirring about among their acquaintances and inducing them to subscribe. These *disinterested* "friends" are "let in," as the phrase is, on "bottom prices;" in other words, they get their shares of stock at cost prices, besides receiving generous commissions for roping in outsiders who pay for their stock two and three times its actual cost in the original investment. Such stocks are known in the market as "watered stocks," and the name as applied to oil stock—more water than oil, which is sometimes a peculiar phenomenon of the oil well—is quite apropos. In reference to the productive value of a particular tract it must be, in many cases, purely hypothetical. Calculations are often based on an assumed fact; sometimes simply on the ground that hard by is a "hundred barrel well" owned and worked by some other company; but cash dividends on the stock will be declared and duly paid—and thus the outsider will be at once assured that he has indeed "struck ile." Matters will proceed in this way for a few months, perhaps, during which time, under this artificial stimulus, the originators of the scheme will find ample opportunity to sell out to eager outsiders. Dividends will then cease, and all these oil stock martyrs will have to show for their investment will be a nicely engraved stock certificate, a few acres of undeveloped land, and a return of perhaps twenty-five per cent, or less, of the original investment in the watered stock. Even these poor profits from the speculation, the certificates excepted, may not be secure in possession; liabilities for the debts of the company may materially lessen them.

According to a carefully prepared table now before us there are more than three hundred and fifty organized companies now in existence, with published capitals, ranging from $50,000 to $10,000,000, and one company, proposing to consolidate several others with it, a capital of $15,000,000.

It is impossible for any sound minded man to ignore the fact that thousands, if not millions of dollars will be abstracted from the people's pockets, and wasted upon a set of men, who, under the guise of respectability, are nothing more nor less than a set of genteel swindlers. As a general rule, we should think it would be safer to look for good investments in any oil stocks rather than in those brought to our notice in the long winded advertisements which appear in the newspapers. Companies which can be relied upon are not obliged to resort to newspaper puffs for their success; and we advise those of our readers who have an itching for oil stock investments to look sharply into the matter before purchasing largely.

The stock speculative fever is now raging throughout the whole community to an alarming degree—and when the reaction comes on, many an unfortunate dupe will suffer a most prostrating debility.

PROF. DOREMUS'S LECTURES.

DELICATE TEST FOR ARSENIC.

The compounds of hydrogen formed the subject of the third lecture of Prof. Doremus's course on pneumatic chemistry. Among the most interesting experiments exhibited was the decomposition of arseniuretted hydrogen by heat. Some hydrogen was produced in a retort in the usual manner by the decomposition of water, and was passed through a U tube containing lime to free it from any carbonic acid that it might contain, and then through a second U tube filled with bits of chloride of calcium to absorb the vapor of water mingled with it, in order to procure the gas perfectly pure and dry. It then entered a small glass tube, the middle portion of which was curved into a flat coil, which was heated red hot. No stain appeared on the tube. But on pouring a solution of arsenic into the retort so as to produce arseniuretted hydrogen, a metallic deposit immediately made its appearance beyond the coil, showing that the gas was decomposed by the heat, when the hydrogen was set free, and the arsenic was deposited in ~~the metallic form~~. ~~The lecturer stated that~~ if oxygen gas was blown backwards into the tube the arsenic would be oxydized, and the crystals of white oxide of arsenic would be found in the tube on the opposite side of the coil.

A NEAT MODE OF MAKING ORPIMENT.

Prof. Doremus explained that chlorine has so strong an affinity for hydrogen that it will take that element from many of its compounds. To illustrate this he introduced a little arseniuretted hydrogen gas under the mouth of a tall inverted bell glass filled with water, when the gas, of course, rose to the top, displacing its own volume of the water. Some sulphuretted hydrogen gas was then poured in the same way up the same glass. On adding some chlorine gas to the mixture, the chlorine took the hydrogen from both the arsenic and the sulphur, when those two elements entered into combination as the sesquisulphuret of arsenic, or yellow orpiment. The hydrogen and chlorine combined to form hydrochloric acid gas, ~~which~~ was absorbed by the water.

FREEZING OF MERCURY IN A RED HOT CUP.

The experiments of the fourth and fifth lectures were mostly repetitions of those made by the same lecturer last winter, and fully described at the time in the Scientific American. One of the most impressive of these was the freezing of a thimble full of mercury in a red hot platinum cup, by means of solidified carbonic acid and ether.

VOTE OF THANKS TO THE LECTURER.

At the close of the last lecture of the course, a vote of thanks was unanimously and most heartily given by the audience to Prof. Doremus, for his exceedingly interesting lectures and brilliant experiments.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING DECEMBER 20, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

45,465.—Machine for Making Match-splints.—Emory Andrews & William Tucker, Springfield, Mass.:

We claim, first, The combination of the series of hoppers, the sectional knife cylinder, E, and the guides, f, on the table, B, arranged, constructed, and operating substantially as described.

Second, The rack, G, to which an intermittent rectilinear motion is imparted by suitable mechanism in combination with the guides, f, knives, e, feed-plate, D, and hoppers, C, constructed and operating substantially as and for the purpose set forth.

Third, The combination of the elastic bands with the stationary lower slat and the upper movable slat in the vertically moving rack by which the match sticks are received and held, at the intervals between the sections or tiers, as they pass from the table under the pressure of the succeeding set.

Fourth, The arrangement substantially as described, consisting of the stationary and movable combs and their operating mechanism by which the alternate match splints within the embrace of the clamp, g, are slipped out so as to detach their points for dipping.

Fifth, We claim arranging the match-splints in the clamps in the manner described, as effected by the combs, r r', so that they may project alternately at each side of the clamp for dipping and so that the tiers of matches being removed from the frame, may be laid upon each other chequer-board fashion, with the blank ends separating the charged ends, preventing the friction of the composition on adjoining matches.

45,466.—Magazine or Self-loading Fire-arm.—John F. Appleby, Mazomaine, Wis.:

I claim the combination of the cartridge ratchet-rod, G, with the breech-piece, C, substantially in the manner and for the purpose herein shown and described.

I also claim the combination of the spring cartridge lifter, I, with the breech-piece, C, and ratchet-rod, G, substantially in the manner and for the purpose herein shown and described.

[This invention pertains to that variety of breech-loading fire-arms known as "magazine guns," in which a considerable number of cartridges are carried in the stock, and are so connected with and operated upon by the mechanism of the arm that the cartridges are successively seized and deposited within the barrel, ready for firing. An engraving and description of it appeared on page 49, Vol. XI., SCIENTIFIC AMERICAN.]

45,467.—Pump.—John Bean, Hudson, Mich.:

I claim the combination of the plungers, M and L, with the center valve, g, and the two valves, n, the whole constructed and operated substantially as and for the purpose herein described.

45,468.—Ore Amalgamator.—John M. Beath, San Francisco, Cal.:

I claim, first, A cylinder so constructed as to take the pulp in at its ends, and discharge it through openings in its periphery, using for that purpose the cylinder above described, or any other that is substantially the same and will have the intended effect.

Second, I claim the described method of arranging the dies on the periphery of the cylinder so as to produce a free circulation of pulp in the tank around the dies and cylinder.

Third, I claim the described method of hanging the dies so that the wear and pressure increases from the front to the back part, the whole being for the purposes set forth.

45,469.—Cartridge Box.—Erastus Blakeslee, Plymouth, Conn.:

I claim the combination of one or more movable metal tubes, each containing two or more cartridges with a spring top cartridge box and side pouch, as herein described and for the purposes set forth.

45,470.—Evaporating Apparatus.—Stephed Bowerman, Battle Creek, Mich.:

I claim, first, The arrangement of the evaporating pans, E, and central zig-zag flue, C, within a closed furnace, A, in such manner that the top and bottom surfaces of said pans will be subjected to the heat radiated from said flue, substantially as described.

Second, A flue, C, which is conducted in its upward course through the furnace in such manner as to form an upper and a lower heating surface for each one of a series of removable pans, arranged substantially as described.

Third, Supporting the flue, C, and also the pans, E, when they are arranged substantially as described upon the frames, F, and rods, a a, substantially as set forth.

Fourth, The application of over-flow pipes, g, to removable or stationary evaporating pans, which are arranged one above the other within a closed furnace, substantially as described.

45,471.—Grain Dryer.—Jonathan S. Buell & Samuel A. W. Marsh, Buffalo, N. Y.:

We claim, first, The combination with a grain-dryer and with a furnace for steam boilers or other fireplace of a reheating furnace and a fan-blower, when the latter is so arranged in a pipe or pipes leading from the primary fireplace into the grain-dryer, substantially as and for the purpose set forth.

Second, The combination and arrangement of the damper, J, and the pipes, D C and I, with the furnace, A, and the rotary fan, R, substantially as and for the purpose set forth.

Third, The combination of the pipe, Q, or its equivalent, with graduated openings with the rotary fan, R, for blowing either a hot or cold blast, substantially as and for the purpose set forth.

Fourth, The combination of the damper, V, with the pipe, C, for the purpose of regulating the draft of the boiler furnace, substantially as and for the purpose set forth.

45,472.—Horse Hay Fork.—Jason R. Cadwell, Dexter, Mich.:

I claim, first, The combination of the hinged toothed handle, C, locking-plate, B, and forked head, A, in such manner that the fork can be used either for elevating hay or as a common dung fork, at pleasure, substantially as described.

Second, Pivoting the handle of a hay-fork to a catch-plate, B, which is affixed to the fork-head, and applying a catch to said handle for fixing it at any desired angle to the tines of the fork, substantially as described.

45,473.—Stern-bearing for Propeller Shafts.—R. E. Campbell, New York City:

I claim the combination of the box, C, wedge, D, and one or more keys, E F, arranged and operating as described.

[This invention consists in the application of a wedge acted upon by a key in combination with the lower box of a stern-bearing, in such a manner that by the action of the key and wedge said box can be readily adjusted as it wears, and when it has completely worn out it can be easily removed and replaced by a new one, without disturbing the bracket.]

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45,474.—Case Shot.—John F. Clew, New York City:

I claim the arrangement of elongated projectiles in a grape or case shot in one or more series with surrounding and interposed disks, substantially as herein specified.

[This invention relates to the use of elongated projectiles in case or grape-shot, and consists in a novel arrangement of, and a new mode of holding together, such projectiles within a case or without one, whereby they are caused to be projected with their points forward and to strike point on.]

45,475.—Submarine Port-hole.--John F. Clew, New York City:

I claim, first, An elastic embrasure constructed substantially as shown, for the purpose of forming a water-tight joint with the muzzel, and sides of ordnance, substantially as above described.

Second, I also claim the ring, J, constructed and operated substantially as above described for tightening the joints of the port-shutter.

Third, I also claim the pipe, s, when applied as shown to the seat of the shutter, A, for the purpose of freeing it of water.

Fourth, I also claim the combination of a sliding shutter with an embrasure whose sides are elastic, substantially as above described, for the purpose of firing ordnance under water.

Fifth, I further claim an elastic embrasure with double conical sides as shown in combination with a tapering muzzle or tapering sides of the ordnance to be used therewith, substantially as above described.

[This invention has for its object to construct a sub-marine port-hole or embrasure. In carrying out his invention, the inventor has provided the usual facilities for the discharge of ordnance, and has also provided suitable means and devices to prevent the water from rushing through the embrasure while in action.]

45,476.—Shaft Coupling.--James P. Collins, Troy, N. Y.:

I claim a divided collar provided with one or more screw threads, and two conical surfaces in its exterior, in connection with nuts and female cones; all arranged to form a new and improved coupling for shafting, substantially as set forth.

45,477.—Basting Gage for Sewing Machines.—Lander T. Conant, New Lisbon, Ohio:

I claim, first, The base-plate, B, with its guide-pins, T T T, diagonal ridges, I I I, deflected edges and slot, S, the whole constructed as described and combined with the upper and middle plates, as and for the purpose set forth.

Second, I claim the vertically movable upper plate, O, with its deflected edges, its sockets, J J J, as seen in Fig. 4, for fitting on the studs or guide-pins, T T T, as seen in Fig. 1, with its diagonal ridges, I I I, as seen in Fig. 4, for the purpose of automatically inclining the cloth against the guide-pins in its passage, to the needles of the machine, substantially as described and for the purposes herein set forth.

Third, I claim the smooth vertically movable middle plate, D, as seen in Fig. 3, with its sockets, J J J, for fitting on the studs or guide pins, T T T, as seen in Fig. 1, substantially as described and for the purposes hereinbefore set forth.

Fourth, I claim the spring, M, or its equivalent, so fastened that its bearing rests on or over the middle ridge, as seen in Fig. 1, for the holding of plates, D and O, in their places and giving a gentle and even pressure from guide-pins to point on all materials passing through the basting gage, substantially as described and for the purposes herein set forth.

45,478.—Stove.--David B. Cox, Troy, N. Y.:

I claim in a horizontally corrugated fire-pot, or plate or plates, forming part or the whole of a first pot, the apertures, C C C, when placed in that part of the corrugation inclining from the center or fire to the outside, at such point as will leave the extreme inner projections of corrugation projecting over said apertures, forming a cover or guard for them for the purposes described.

I claim in combination with said corrugations and apertures, the air chamber, B B B B, for the purposes described.

45,479.—Field Hospital Cot and Stretcher.—Wm. Dann, Cincinnati, Ohio:

I claim the combination of the poles, A A, posts, C, bar, E, with the sockets or braces, B D, the latter being constructed in the manner herein described and employed to admit of the parts being readily put together or taken apart, as explained.

[The object of this invention is to adapt a cot to the requirements of a field hospital. The cot may be readily put together, taken apart and packed for transportation; may be set up with the patient raised from the ground, as an independent bed. It consists of but few pieces which are not of a character to be lost or mislaid, and is fastened together in such a manner that it is possible for an ordinary mechanic to replace a missing piece.]

45,480.—Manufacture of Paper Pulp from Wood.—John W. Dixon, Philadelphia, Pa.;

I claim, first, The manufacture of pulp from wood by treating the wood with a solution of caustic soda at 18° Baume, or higher, and at near or about 212° Fah., and below 290° Fah.

Second, The succession reuse of the waste liquor from the first wood pulping process in a second or third wood pulping process by the addition of reduced percentages of fresh caustic soda, substantially as above described.

45,481.—Horse-rake.—Thomas H. Dodge, Worcester, Mass.:

I claim the employment in connection with the rake-head eccentrically as described of the gears, H I, shaft, b, and hand-lever, K, all arranged substantially as and for the purposes described.

I also claim the combination with the rake-head, hinged as described, of the ping, g, and spring-catch lever, M, substantially in the manner and for the purposes set forth.

I also claim the arrangement in combination with the rake-head, G, gears, H I, and shaft, d, provided with hand and foot levers, K d e, of the elevating and lowering rope, L, substantially as and for the purposes described.

45,482.—Machine for Counting.—John Dolbeer, San Francisco, Cal.:

I claim arranging the three indexes, C C' C'' to move around a common center substantially as described, in combination with the counting arm, B, pawl, S, and dial plate, A, for the purposes set forth.

45,483.—Tool for Boring Holes.—Augustus Eliaers, Boston, Mass.:

I claim a lever cutter attached to or working within a screw-shaft, and so operated upon by a nut and spring or their equivalents, that the length of its radius from the center of said screw-shaft can be increased or diminished at pleasure while being revolved, for the purpose of forming undercuts, substantially as described.

45,484.—Chain-pump.—L. A. Fisher, Chicago, Ill.:

I claim the combination of the movable buckets with the mechanism for changing the position of the same, substantially as set forth.

45,485.—Car-replacer.—George Fowler, Macon, Ill.:

I claim the clamps, C C' in combination with the rails, B' B'', and bar, D, all constructed and arranged substantially as and for the purpose herein set forth.

[The object of this invention is to obtain a device of simple construction which may be readily applied to the rails of a railroad track in order to place a car thereon.]

45,486.—Cow-milker.—G. H. Gardner, Philadelphia, Pa.:

I claim, first, Stop-cocks so combined with a cow-milker, so constructed and so arranged in respect to the teat cups of the same, that the operation of the instrument on one or more of the teats may be discontinued while it is continued on the remaining teats.

Second, The three way cocks, E, with their branches, e and e', and the several openings herein described, in combination with the four branches, D D' D'' and D'''.

45,487.—Spring Bed Bottom.—James E. Gillespie, Trenton, N. J.:

I claim the combination of the spring, B, and link, F, with the slat, D, and the rail, A, the whole being constructed and arranged to operate substantially as specified.

45,488.—Veneer-cutting Machine.—J. R. Graham, New York City:

I claim the stay-plate, F, when made adjustable as specified, and for the purpose set forth, in combination with the cutting knife, substantially as described.

45,489.—Preparation of Fine-cut Tobacco.—Peter N. Greer, New York City:

I claim a plug tobacco formed from the shorts, prepared and put up as herein above described, by pressing, substantially as described and for the purpose set forth.

45,490.—Portable Picket Fence.—George Gross, Buffalo, N. Y.:

I claim the arrangement and combination of the devices for locking, adjusting, bracing and supporting the portable picket fence, as herein described.

45,491.—Gas and Water Pipe.—Wm. B. Guy, Boston, Mass., assignor to E. H. Austen, Madbury, N. H.:

I claim, first, The inner tube of glass separated from the pipe, in the manner and for the purpose set forth.

Second, Any elastic or plastic substance placed between the pipe and inner tube or lining, substantially as and for the purpose described.

45,492.—Saddle Tree.—Emery E. Hardy, New York City:

I claim, first, The turret plate of a saddle tree, constructed and arranged as described.

Second, In combination with the turret plate and saddle tree, the socket, N, the crupper loop, F, and pin, K, attached to the seat as described and set forth.

Third, Lining a metal saddle seat with wood or leather, so that the covering of the seat or a welt may be tacked to it.

45,493.—Lamp Burner.—John O. Harris, Reading, Pa.:

I claim the employment or use in a connection with a lamp burner of two jackets, E E', placed one within the other, and provided with one or more horizontal slots. e, extending through both jackets, and either with or without the end draught passages, d d, substantially as and for the purpose herein set forth.

[This invention relates to an improvement in that class of lamp burners which are designed for burning coal-oil and similar hydro-carbons which require a large amount of oxygen to support combustion and produce a good illuminating flame.]

45,494.—Tubular Boiler.—Charles Hawthorn, Pittsburgh, Pa.:

I claim making the holes in the heads of tubular boilers, for the insertion of the flues, with a gutter in the wall or sides of the flue hole and forcing the sides of that part of the flue, which passes through the hole, down into the gutter, so as to make the flue conform to the shape of the hole, substantially as for the purposes hereinbefore described.

45,495.—Breech-loading Fire-arm.—Hiram W. Hayden, Waterbury, Conn.:

I claim, first, A breech block, having a chamber passing entirely through it, and fitted upon trunnions in combination with the pendent jaws, k, and lever, h, substantially as specified, whereby the said lever first slides the breech block back and then partially rotates it, and the reverse in closing the breech, as set forth.

Second, I claim the shear, 7, in combination with the swinging breech block, e, having the chamber, f, passing entirely through said block, and the projections, 9, taking the ribs, 8, for keeping the rear portion of the breech block to the shear, as set forth.

Third, I claim a sliding breech pin, l, in combination with a chambered breech swinging on trunnions and acting to close the rear end of the chamber in said breech when on line with the barrel, as set forth.

Fourth, I claim the wedge, m, and forks, o o, in combination with the sliding breech pins, l, and swinging breech, e, having a chamber passing through it, whereby the breech pin, l, is secured at the rear end of the chamber in the swing breech, as set forth.

Fifth, I claim the screw, r, and spring in the slot of the breech pin, for the purpose and as specified.

Sixth, I claim the combination of the lever, h, breech, e, breech-pin, l, and wedge, m, whereby said lever effects the movement of all the parts in harmony with each other, as specified.

45,496.—Pipe Tongs.—Henry Herbert, Cincinnati, Ohio:

I claim as a new article of manufacture the adjustable pipe tongs, hereinbefore described, provided with the slot, J, pivot, I, nut, M, corrugated washer, K k, corrugations, b'', and dovetail sockets, a b b', all as specified.

45,497.—Clock Dial Sash.—George Hills, Plainville, Conn.:

I claim the combination of the ring or rim, e, dogs, h, with the sash glass, and dial, c d a, substantially as and for the purpose described.

45,498.—Inkstand.—Philip K. Holbrook, Malden, Mass.:

I claim the reservoir, B, with its flexible tube, C, and dipping cup, D, arranged in the stand or base, A, and operating substantially as set forth.

45,499.—Shifting Blind.—Byron C. Howell, Ithaca, N. Y., and A. B. Thompson and E. D. Snyder, Oswego, N. Y.:

We claim, first, Constructing and arranging a blind that it may be lifted or reversed, and worn first one side out and then the other without removing the hinges thereof.

Second, The constructing and arranging the blind, hinges and rod in the manner herein described and for the purposes specified.

45,500.—Lamp-chimney Cleaner.—Ferdinand Imhorst, New York City:

I claim a lamp chimney cleaner with two pans, A B, applied to the ends of two levers, A' B', of unequal lengths, and hinged together substantially in the manner herein shown and described.

[This invention consists in the application of two pads attached to the ends of two levers which are of unequal length, and connected together in the manner of shears, in such a way that when those ends of said levers which carry the pads are closed, they can readily be introduced into a lamp chimney and by pressing on the rear ends of the levers the pads are pressed against the inner surface of the chimney, and by turning the levers in the chimney, or both in opposite directions, the pad at the end of the long lever cleans the top, and the pad at the end of the short lever the bulb of the chimney in an easy and perfect manner.]

45,501.—Knitting Machine.—G. Gensen, of Brooklyn, N. Y.:

First, I claim the screw-formed gear, n, and gears, m and r, in combination with the shafts, k and q, for rotating the bobbin gears, and wheels inside and outside the stationary cylinder of needles, as specified.

Second, I claim the changeable ring of needles, fitted substantially as specified, in combination with the adjustable standards, e f' and d', of the gear, e', wheel, f, and bobbin, d, as specified.

Third, I claim the take-up wheels, v v', in combination with the belt, 13, and wheels or pulleys, y z and z', arranged and acting substantially as specified.

45,502.—Horse Rake.—George Kimball, Springfield, Vt.:

I claim the two lever frames, F' F', attached to the rake head, G, as shown, in combination with the lever, J, attached to the axle, A, and connected to the frame, F, by the rod, K, when said parts are used with a rake attached to the thills, C C, in front of the wheels, B B, and all arranged to operate substantially as and for the purpose set forth.

[This invention consists in having the rake attached to the thills in front of the wheels, and having hand and foot levers arranged and applied in such a manner that the driver, while on his seat, and when the rake is at work, will have perfect control over the latter so as to keep it in proper working position, and allow it to yield or give to conform to the inequalities of surface over which it may pass, and also readily raise it in order that it may discharge its load.]

45,503.—Corn Cultivator.—A. Kinyon.—Amboy Ill.:

I claim, first, The tubular shaft, G, having the plow beam, I I, attached to it by straps. T, in connection with the rod, R, fitted loosely in said shaft and connected by pendants, H, with the beams, H, and connected by a strap or cord, q, with a pulley, V, all arranged substantially as shown, to admit of the adjustment of the plows, as set forth.

Second, The attaching of the front ends of the plow beams, I I, to the parts, b b, of the draught pole through the medium of the swinging bent bars, O O, connected by a draught equalizer composed of the rods, Q Q, chains, j j, rod, l, and pulley or pins, k, all arranged substantially as and for the purpose set forth.

Third, The securing of the standards, J, to the beams, I, by means of the eyes, d screw rods, e, and nuts, f, to admit of the adjusting of the plows, L, as set forth.

Fourth, Constructing the draught pole of two parts, b b, arranged in V form and attached to the axle, A, as shown, when said pole, thus constructed, is used in connection with the plow beams, I I, arranged with the mechanism described for adjusting them vertically or laterally, as specified.

[This invention relates to a new and improved corn cultivator, of that class in which laterally-moving plows are employed for adjusting the same to the rows of plants, so that they may conform to their sinuosities.]

45,504.—Combined Caster and Cooler for Soda Fountains.—Thomas Larter, Cleveland, Ohio:

I claim, first, The separate glass cruets, H, provided with the tube, h, and faucet, h', when arranged and operating in the manner and for the purpose set forth.

Second, I claim the ice chamber, B, in combination with the chamber, D, and cruets, H, when the whole are arranged as herein set forth

45,505.—Washstand, Bureau, Desk and Wardrobe.—Anson Lee, New York City:

I claim a combined washstand, bureau, writing desk and wardrobe, constructed as herein set forth, as a new article of manufacture.

[The object of this invention is to combine a washstand, a bureau, a writing desk, and a wardrobe all in one piece of furniture, thereby producing an article of the greatest convenience, particularly for people living in cities where a saving of space is a great desideratum.]

45,506.—Uterine Supporter.—James Lee, Stevens' Point, Wis.:

First, I claim producing an enlargement of the stem, A, in the manner and for the purpose above set forth.

Second, In combination with the flexible stem, A, I claim the rigid stem, C, when arranged and operating as described.

Third, I claim the combination of the pessary, D, with the supporting stem, A, as herein described.

45,507.—Metallic Head for Barrels.—Sylvester Lewis, Rochester, N. Y.:

I claim the application to a metallic barrel or cask head of two or more beveled projections upon the outer rim thereof, as above described, and the application of gum shellac or other similar substance to the same, as herein set forth. Also the circular elevation around and adjoining said space, A A, for the protection of the staves as aforesaid.

45,508.—Damper for Flues.—John Liming, Philadelphia, Pa.:

I claim the application to a stovepipe or other external escape flue of a heater, of an opening, B, adjustable by means of a damper constructed so as to operate substantially in the manner described and set forth for the purpose specified.

45,509.—Car Coupling.—B. F. Marsden, Galena, Ill. Ante-dated Dec. 9, 1864:

I claim the two openings, a a', in the draw heads, A A, in combination with the two links, B B, and the removable or rising and falling jointed pins, C C, all arranged substantially as and for the purpose herein set forth.

45,510.—Process for Preparing sawdust for Paper Pulp.—Harrison B. Meech, Fort Edward, N. Y.:

I claim the peculiar process by me above described for treating sawdust preparatory to converting it into a suitable material for the manufacture of paper, substantially in the manner and for the purposes above described.

40,511.—Artificial Limbs.—Anton Mermel, New York City:

I claim the construction of artificial limbs by means of the strips a b and c, in combination, cemented compactly together, the shells d e and f, forming one shell, substantially as above described.

45,512.—Tool for closing or contracting the Barrels of Watches.—Chas. S. Mosely, Waltham, Mass.:

I claim the above described tool, consisting essentially of the anvil, B, and the conical die, C, suitably guided in a frame or stock, and operating substantially as described for the purpose specified.

45,513.—Night Burner.—Walter P. Newhall, Peekskill, N. Y. assignor to Geo. P. Ganster, New York City:

I claim the device, C, applied to common coal-oil burners, constructed of the cap, e, plate, d, and rod, f, and for the purpose of being operated from the outside of the chimney holder, as herein shown and described.

45,514.—Belt Tightening,—John Nichois, Fond du Lac, Wis.:

I claim, first, The combination of the rod or shaft, N, guided by the cross bar, Q, with the screw, M, and pulley shaft, B, when constructed and arranged substantially as set forth.

Second, I also claim the movable box, P, in combination with the screw, Y, for leveling the shaft, B, substantially in the manner described.

45,515.—Grain Elevator.—John Nichols, Fond du Lac, Wis.:

I claim, first, The arrangement and combination of the index wheel, H, with the revolving spout, E, operated by pulleys and hand, substantially in the manner and for the purposes set forth.

Second, I claim the use of the circular table, L, attached to the elevator pipe, A, substantially as described.

Third, I also claim the combination of the table, L, with the elevator frame and the revolving spout, substantially as specified.

Fourth, I claim the use of the pulleys, I, in combination with the vertical pulley, H, and horizontal pulley, F, and band, G, substantially as specified.

45,516.—Saw-mill.—John C. and J. L. Nutt, Jefferson, Opio:

We claim, first, The adjustable block, a, screw, f, or its equivalent, in combination with the parallel rods, d d', and tension rod, h, as and for the purpose set forth.

Second, We claim the arrangement of the sectional circles, c c, in combination with the vibrating sash frame, B, operating conjointly as and for the purpose described.

Third, We claim the arrangement of the sliding frame, n, spring, g, in combination with the arms, i j, pulley, p, and vibrating frame, operating as and for the purpose described.

45,517.—Grain Separator.—E. C. Patterson, Chicago, Ill.:

I claim the combination and arrangement of the series, C D E, the channels, F F' F'', and the screens, c d, substantially as and for the purposes herein delineated and set forth.

45,518.—Composition for Crayons.—Isaac N. Peirce, Boston, Mass.:

I claim the combination of the kaolin with the several ingredients specified, substantially in the proportions and for the purpose set forth.

45,519.—Coupling for Carriage Shafts,—Timothy Pendergast. New Haven, Conn.:

I claim a key constructed as described in combination with an eccentrically-formed connection, E, and coupling, c, when arranged to operate in the manner and for the purposes specified.

45,520.—Wheel Plow.—Jabish Pierce, Wyanet, Ill.:

I claim the rod, O, links, T and R, in combination with beams, D, link, N, bounds, B, standard, H, lever, c, when constructed and arranged as herein described.

45,521.—Clothes-drying Machine.—William Price, Cincinnati, Ohio:

I claim, first, The construction and arrangement of a cylindrical apparatus, the same having a series of ventilators with sliding cov-

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ers to admit and regulate the circulation of dry or heated air for the purpose of drying clothes, as herein described.

Second, I claim a series of radiating frames, they being constructed with double yielding rods or bars, so as to admit the clothes being easily attached to them, for the purposes herein set forth.

Third, I claim a rotary clothes frame in combination with a fan blower, so that a current of dry or heated air is distributed through and among the clothes, substantially as and for the purposes herein specified.

45,522.—Governor.—J. T. Rich, Rahway, N. J. Ante-dated Dec. 14, 1864 :

I claim the combination of the screw, D, spindle, C, and spring, G, all arranged and operating as and for the purposes specified.

45,523.—Catamenial Bandage.—D. F. Robertson, Middletown, Conn.:

I claim the elastic tape around the border of the sack for controlling the adaptation and fit of the sack, as herein set forth.

45.524.—Screw Gripe.—D. M. Robertson, Manchester, N. H. Ante-dated Dec. 9, 1864 :

I claim the levers, G G, in combination with the jaws, E, and traversing collar, I, for the purpose of griping the article placed in the jaws.

I claim providing the levers, G G, with an adjustable fulcra, for the purposes specified.

45,525.—Rail for Street Railways.—T. M. Schleier, Nashville, Tenn. :

I claim the constructing of rails for railroads with oblique angular notches, presented in opposite directions, substantially as and for the purpose herein set forth.

45,526.—Caloric Engine.—Theodore Schwartz, of New York City. Ante-dated Dec. 7, 1864 :

I claim, first, The combination of devices hereinabove described for maintaining constant temperature in compression and expansion.

Second, The use of an exhaust pump for developing partial vacuum action through combination of rarification by piston with condensation by cooling as stated.

Third, A generator containing liquid for transmitting heat through external action to the working cylinder, substantially as described.

Fourth, Applying the waste heat of the escaping fire currant upon a portion of the cold compressed air to be heated, as described.

Fifth, Feeding the fire with hot air heated through auxiliary regenerator, substantially as described.

Sixth, The use of an exhaustible receptacle, as stated, in working the same air over and over again.

Seventh, The use of the tubes inclosing liquid for regeneration of heat, as shown and described.

Eighth, The bottle-shaped heaters with or without the loose tube inside, as applied under the bottom of the generator.

45,527.—Tunnel.—Samuel J. Seely, New York City :

I claim a wall of concrete inclosed between iron plates with flanged edges, the flanges upon the outer plates serving as ties to prevent their sides from spreading apart by their connection with the other, and the inner serving as stays to the flanges of the other part and to confine the concrete in its place, substantially as described.

45,528.—Sewing Machine.—Dewitt C. Smith, Cincinnati, Ohio :

I claim the combination of the eccentric, F, and its collar, a, and and lugs, b c, with the mechanism, substantially as described, for connecting them with the several moving parts of a sewing machine, for the purpose of operating and timing the motions of the needles, shuttle and feed, as herein described and represented.

45,529.—Calipers.—R. D. O. Smith, Washington. D. C.:

I claim, first, Calipers having only one pair of legs and provided with two scales, so that the same pair of legs may be used for either inside or outside measurements, and the diameters measured be determined by said scales without the aid of rule detached scale, substantially as described.

Second, A double scale for caliper with a single pair of legs, when one half of such scale is upon one blade and the other half of each scale is upon the other blade of the calipers, substantially as described.

45,530.—Wind Wheel.—Robert L. Smith, Stockport, N. Y. :

I claim, first, The combination of a wind wheel and power-retaining mechanism provided with a weight, and all arranged substantially as herein shown and described, so that the wind wheel, when unemployed, will raise the weight and accumulate power which may be employed during the absence of wind, or when the wind wheel is inoperative.

Second, The arranging of the gearing a* a* b* b* p' o', drum, O, and the ratchets, R n*, with the pawls, r' r' and J, for the purpose of operating the weight or power-retaining mechanism from the wind wheel, as set forth.

Third, The lever, R, in connection with the notched bar, S, arranged in connection with the weight, Q, and cord, S', for automatically cutting off the connection between the wind wheel and the weight mechanism, as set forth.

Fourth, The wind wheel governor composed of the racks, h h, springs, j, and balls, i i, and connected with the wings or sails, a, through the medium of the gearing, g f, and segments, e, all arranged substantially as herein shown and described.

45,531.—Frame for Harvesting and Seeding Machines.—J. H. Snyder, Killbuck, Ill. :

I claim, first, Hinging or jointing the frame, A and A', together at a, as and for the purpose set forth.

Second, I claim the quadrant levers, H' H', casters, H H, and cords, g' g', in combination with the adjustable frame, A, as and for the purpose set forth.

Third, I claim the combination of the compound levers, d c, rod, d', and lever d", when arranged as and for the purpose set forth.

Fourth, I claim hinging or connecting the shaft, c, to the shaft, B', so that the bearing, C", and the connection of the brace, c", to the shaft, B', will allow the shaft, c, to rotate in its bearings, and at the same time be self-adjustable to any desired position of the frames, as and for the purpose set forth.

Fifth, I claim the caster wheel, F, rudder wheel, F', spring guide, f', and windlass, G, in combination with the adjustable jointed frames, A' A, when arranged as and for the purpose set forth.

Sixth, I claim the fastenings, J J', and arms, A" A", in combination with the adjustable frame, A', as and for the purpose set forth.

45,532.—Safety-device for Locks of Fire-arms.—E. T. Starr, New York City :

I claim the combination with the hammer, D, of a lever lock, E, when the said lock is so made and arranged as to be operated by the act of raising or letting down the hammer, substantially as herein shown and described.

[The object of this invention is to prevent the hammer of the fire arm from being accidentally driven or forced against the cartridge or cap, and thus to avoid the danger of those premature explosions by which life and limb are so often sacrificed.]

45,533.—Seeding Machine.—Julius M. Stebbins, Appleton, Wis.:

I claim, first, The use of two series of cylinders, A A', revolved upon a single shaft, J, with sliding rings, C C', operating as and for the purpose set forth.

Second, The double extension or dividing cap, B, with two orifices, O and O', substantially as described. Also its use in combination with revolving cylinders for gaging the discharge of two or more kinds of seed at the same time.

Third, The use of a beveled flange, H H, when used substantially as and for the purpose set forth. Also its use in combination with a funnel or cylinder, substantially as described.

45,534.—Process for Amalgamating Ores.—W. F. Stewart, of Austin, Nevada Ter.:

I claim a new and improved mode of working silver ores and saving amalgam and quicksilver, as above described.

45,535.—Angle Protractors.—Henry Taylor, of the U. S. Navy :

I claim the radius arm, E, provided with a suitable scale, and operating in combination with the revolving compass circle, D, which is adjustable on the graduated scale, B, and with the parallel rulers, A, substantially in the manner and for the purpose herein shown and described.

[This invention is particularly intended to facilitate the operations of laying off courses on board ships, and of locating a ship's position on a chart from cross-bearings, and also the operation of plotting a day's work, rendering it unnecessary to keep a traverse table of corrected courses, and the operation of ascertaining bearings between points. It may also be used with advantage in drafting, surveying and other operations of a similar nature.]

45,536.—Safes.—W. R. Terwilliger and Daniel Fitzgerald, of New York City. Ante-dated April 26, 1864 :

We claim, first, Making a safe, or the walls of a safe, proof against burglar tools, by casting hard iron over a core prepared by punching three sides of the holes and turning out the metal, in the manner described.

Second, Making the tongues, B, which are turned out by punching of a dovetail form, so that they will hold the iron when cast upon it in the manner described.

Third, Turning out the dovetail tongues on the opposite sides, for the more perfect holding the metal, in the manner described.

45,537.—Treating Wood for the Manufacture of Boxes, Cases, Etc.—Horace Thayer, of Warsaw, N. Y.:

I claim the within-described method of manufacture of ends or heads for boxes, and analogous structures, the wood being steamed, sliced, seasoned, cut in shape, coated or filled with an insoluble varnish, and dried, smoothed and finished in the order and by the means substantially as herein set forth.

45,538.—Ends or Heads for Boxes, Cases, Etc.—Horace Thayer, of Warsaw, N. Y.:

I claim as a new article of manufacture and commerce the ends or heads described, for boxes and analagous structure, the same being formed of wood or analogous porous material, coated or filled with an insoluble varnish, so as to combine the qualities of cheapness, elasticity, stiffness and impenetrability, as herein set forth.

45,539.—Sewer Pipes.—George S. Tiffany, of Palmyra, Mich.:

I claim making the shaft, D, of the grinding mill tubular, in combination with the central shaft, K, having casting, P, and cove-pin, R, thereon, and funnel, G, arranged to operate substantially as and for the purpose herein set forth.

45,540.—Horse Power.—A. W. Tooker, of Chemung, Ill.:

I claim communicating a rotary motion to the driving shaft, D, from the master wheel, B, by means of convergent shafts, C C', carrying spirally-flanged drum, G G', which are acted upon by means of friction rollers, applied to the master wheel, substantially as and for the purposes described.

45,541.—Stove-cover Lifter.—Sylvenus Walker, of Tremont, N. Y.:

I claim as a new article of manufacture, a stove-cover lifter, tack drawer, plate and dish lifter, pot and kettle-lifter combined, consisting of handle, A, lifter, B, tack-drawer, e, lifter, C, with claws, F G H I, and hook, E, when combined and arranged as described, for the purpose set forth.

45,542.—Camp Kit.—Jacob Walkley, of Monroe, Wis.:

I claim, first, Constructing a packing case by the union of the plates, A and B, substantially as and for the purpose set forth.

Second, I claim forming a handle for the frying pan, C, by means of the spoon, a, substantially as set forth.

Third, In combination with the packing case, constructed as shown, the coffee pot, cups, boxes and other articles, substantially as shown and described.

45,543. Process of Brewing Malt Liquors.—Chas. R. M. Wall, of Brooklyn, N. Y.:

I claim, first, Increasing the specific gravity of the mash by the addition of sugar or molasses, in about the proportion specified, for the purposes herein set forth.

Second, Boiling the wort or extract of malt under pressure higher than that of the ordinary atmosphere, substantially as and for the purpose described.

[This process differs from the ordinary process; first, in the manner of treating the malt before grinding; second, in the manner of treating the mash and of boiling the wort, or extract of malt, after the same has been separated from the malt; third, in the manner of boiling the wort preparatory to introducing the same in the fermenting tubs, and during the fermenting process.]

45,544.—Churns.—C. A. Warren and A. C. Baldwin, of Tiffany, Ohio :

We claim, first, Attaching the crank, C, to the wheel, g, by means of a tenon, h, formed on this wheel, and a socket formed in the crank, in combination with the screw-fastening, i, substantially as described.

Second, Applying the dashers, D D, to the shaft, B, in oblique planes to the axis of this shaft, substantially as shown in figure 3.

Third, The removable inclined deflecting board, G, arranged within the chamber, substantially as described.

Fourth, The construction of the chamber, A, with a secondary bottom or shelf, A2, substantially as described.

45,545.—Brake for Railroad Cars.—Lewis Watson, South Plymouth, Mich.:

I claim, first, The construction and operation of the apparatus herein described, consisting of the combination of the friction plate, A, and friction wheel, B, with the car wheel to which it is attached, the chain, C, and ring, D, pawl and spring, E, screw, F, and burr, G,

Second, I also claim the combination of the weight, H, friction collar, I, and collar, K, chain, L, and chain, M, and shaft, N, when constructed and operating substantially as and for the purposes herein shown and described.

45,546.—Machine for making Shovel Handles.—William Wells, Middletown, Mass.:

I claim, first, Clamping the shovel handle both at its head and along its shank by means of the clamp, O, and bar, H, with its forks, h h, during the operations above described, substantially as above set forth.

Second, I also claim completing the D-opening in the head of the shovel handle, by means of the suspended vertical die-cutters, e e, of different sizes, operated in succession and brought vertically over the shovel head, substantially as described.

Third, I also claim the swinging bed piece and its cutter, u, for forming the end of the shovel head, constructed and arranged substantially as above described.

[This invention consists in a novel construction of machinery for cutting out and finishing the "D-part" or heads of shovel handles, in which the cutters are operated automatically by means of combs.]

45,547.—Spinning Jack.—Frederick C. Werner, Beacon Falls, Conn.:

I claim the movable bar, f, applied in combination with the belt shipper, J, carriage, A, and tappet, g, in the manner and for the purpose substantially as set forth

45,548.—Street Sweeping Machine.—M. F. Wickersham, Springfield, Ill. Ante-dated Dec. 25, 1862:

I claim, first, The combination of the main frame, D, with the overhanging frame, E, and elevating buckets, H, when the rear end of said main frame is made to extend so as to counterbalance the frame, E, with its buckets, H, and chain wheel, F, and furnish a purchase by which said overhanging frame may be raised or lowered.

Second, The combination of the vibrating brush frame, J, with the elevating buckets, H, and driving wheel, M, so that the brush can move up or down without ungearing and at the same time throw the dirt in the buckets as set forth, while it follows the uneven surface of the ground.

45,549.—Corn Cultivator.—Daniel Wilde, Washington, D. C.:

I claim, first, The levers, u, resting on the front bar of the frame and supported near the middle by the notched plates, w, secured to the uprights, x, and operating as and for the purposes herein recited.

Second, I claim the arrangement of the rocking bar, g, elevated bar, m, in relation to the handles and the shovel stakes, for the purpose herein set forth.

Third, And in connection with the arrangement of the rocking bar, g, bar, m, and the shovel stakes, I claim the stirrups, q, for the purpose herein named.

Fourth, I claim the plate, j, with its inclined and horizontal faces, k and l, for the purpose herein set forth.

45,550.—Harvester.—John S. Williams, Chicago, Ill.:

I claim, first, The plate, F, provided with the rod, q, substantially as herein set forth.

Second The combination and arrangement of the pitman rod, the jointed lever, o, and the fulcrum, p, when operating substantially as described.

Third, I claim the combination and arrangement of the lever, v, the connecting rod, x, the lever, y, the fulcrum, s, and the arm, r, when operating substantially as and for the purpose described.

Fourth, The combination and arrangement of the axle, N, the frame, W, and the platform, I, when constructed substantially as herein specified.

45,551.—Pump.—Francis G. Wynkoop, Corning, N. Y. Ante-dated April 29, 1863 :

I claim the annular piece of rubber, d, provided with an inclined inner face, c, in combination with the piston and loose valve plate, g, when arranged to operate in the manner substantially as described, also in combination with the above the rubber gasket, i, arranged in the manner and for the purpose specified.

[The invention consists in the use of an annular piece of rubber fitting the inclined or conical face of the piston, in combination with a metallic disk or valve plate, whereby the rubber, by the weight of the superincumbent water, is expanded and caused to fill the space between the piston and chamber during the ascent of the former; and is retracted or restored to its original shape by its resiliency and that of the gaskets aided by the force of the water passing through the valves of the piston during the ascent of the latter; thus entirely relieving the packing or annular pieces of rubber from contact with the chamber, and at the same time allowing it to lubricate and free itself from any sediment or sand which may have been drawn into the chamber by the water passing through the space between and the chamber.]

45,552.—Construction of Railways.—Theodore Yates, Milwaukie, Wis.,

I claim the combination of the T-rail, A, wooden subrails or longitudinal sleepers, B, and the clamps or chairs, D, or their several equivalents, arranged and employed in the described combination with the longitudinal subrails, B, substantially in the manner and for the purposes herein set forth.

I also claim the clamp, D, constructed in one piece as described, and employed in the described combination with the longitudinal subrails, B, to secure the iron rails at their joints and protect the wooden subrails beneath said joints, as set forth.

[This invention relates to a railway in which the common rails are so applied and secured to subrails or longitudinal sleepers, resting upon the ties, that the track is rendered more firm and durable, and less liable to derangement than when laid in the ordinary manner.]

45,553.—Bung Stave for Barrels—Annie Acker, Administratrix of the estate of Frederick Acker, deceased, San Francisco, Cal.:

I claim the metallic stave or segment of stave, A, provided with longitudinal tongues, d d, and threaded for the reception of a screw plug or bung, B, substantially as herein described.

45,554.—Match Safe.—Wm. H. Andrews (assignor to Burton Mallory), New Haven, Conn.:

I claim a metallic box, constructed and made self-closing, as and for the purpose described.

45,555.—Turning Lathe. Charles G. Bloomer, Wickford, N. Y., assignor to Eberhard Faber, New York City :

I claim, first, The employment or use for the purpose of feeding the stuff to be turned to the tools, of a screw thread cut in the guide, substantially in the manner and for the purpose described.

Second, The forked guide, F, made in two parts one of which is hinged and arranged to swing open when desired, the whole being constructed so as to straddle the roughing out tool, substantially as and for the purpose set forth.

Third, The employment of a rotating cam, h, applied in combination with the roughing out tool, in the manner and for the purpose substantially as described.

Fourth, The combination of the yielding head, t, with the cutting off tool, s, arranged substantially as and for the purpose specified.

45,556.—Stove Pipe Drum.—Peter Cocker (assignor to himself and John Taylor), Philadelphia, Pa.:

I claim constructing a stove pipe with a jacket divided into flues connecting with the main pipe or flue, the draft of which being controlled by a damper in the main pipe, as described and for the above purpose.

45,557.—Hoop Skirt.—Smith Collins (assignor to himself and Samuel Peck), New Haven, Conn.:

I claim a hoop skirt when the hoops are formed from corrugated or concavo-convex wire, substantially as and for the purpose specified.

45,558.—Tobacco Press.—John H. Fellows, Lewisport, Ky., assignor to himself and D. Dunn, Louisville, Ky.:

I claim the toggle arms, D D', windlass, E, and follower, C, in combination with the balance weight, k, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the application of two pairs of toggle arms acted upon by a rope and windlass, and of a balance weight suspended from a suitable rope running over pulleys in combination with the press bar or follower of a press, in such a manner that by the action of the windlass and toggle arms the follower can be depressed with great force, and on releasing the toggle arms the follower is carried back to its original position by the action of the balance weight, without the aid of the operator, or with very little exertion on his part.]

45,559.—Double-acting Compress.—John H. Fellows, Lewisport, Ky., assignor to himself and D. Dunn, Louisville, Ky.:

I claim the followers, E E', connected by rods or other equivalent means to followers, F F', and operating in combination with the cross head, c, and toggle arms, D, in the manner and for the purpose substantially as set forth.

This invention consists in combining two pair of sliding followers with each other and with an intermediate cross head and pair of toggle arms in such a manner that by imparting to the cross head a longitudinally sliding motion in the proper direction, the two pairs of followers, situated on either side of the cross head, are caused to close up, and by moving the cross head in the opposite direction the followers are caused to open simultaneously, and by this arrangement two bales of cotton, hay, or other material can be pressed at once and in the same time, which, with presses of the ordinary construction, is occupied in pressing one bale.]

45,560.—Magazine or Self-loading Fire-arm.—Joshua Gray, Medford, Mass., assignor to himself, E. H. Eldridge, S. S. Bucklin and W. G. Langden :

I claim, first, The rack, F, arranged below the sector, D, for the purpose described.

Second, Moving the cartridge carrier from the magazine to the barrel, and vice versa, by passing it through a longitudinal slot in the breech pin and sliding the latter over it.

Third, So constructing the end of the cartridge lifter as to cover the port of the magazine, when the rifle is used as a breech-loader.

Fourth, The slot, L, to guide the cover or end, K, of the cartridge carrier, as described.

Fifth, The cartridge extractor, M, in combination with the arm, N, provided with the knob, e, or its equivalent, as described.

Sixth, The cam, R, in combination with the hooked lever, S, or their equivalent, for the purpose of withdrawing the cartridge case without uncovering the magazine, when it is required to use the rifle as a breech-loader.

Seventh, The guide pin, H, in combination with the groove, I, for stopping and guiding the breech pin, as described.

45,561.—Manufacture of Sugar.—F. W. Goepling (assignor to H. F. Briggs, L. Bradley and himself), of Buffalo, N. Y.:

I claim a new and improved compound sugar made by a combina-

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tion of cane sugar or cane sirup with corn sirup, substantially as set forth.

45,562.—Method of Removing Harbor Obstructions.—John D, Hall (assignor to himself and Osborn Conrad), of Philadelphia, Pa.:

I claim the employment of a cannon, in connection with the jaw, B, and the adjustable inclined plane or spars, A, and fork, n, attached to a monitor or other vessel, for the purpose of removing obstructions from harbors, channels, etc., substantially as described.

45,563.—Brick-pressing Machine.—James Hotchkiss (assignor to himself and Ezra Buss), of Springfield, Ohio:

I claim imparting the pressure to the bricks by means of two stationary pressure wheels, P Q, between which the mold wheel passes continuously, substantially in the manner herein specified.

I also claim such arrangement of the pressure wheel, P Q, that the upper wheel shall simply hold the lids closely and firmly down upon the mold wheel, while the active pressure is produced by the lower wheel, lifting the followers, substantially as herein set forth.

I also claim regulating the pressure and the thickness of the bricks by adjusting the bearing blocks, r r, of the lower pressure wheel, Q, as herein described.

I also claim hinging the lids, F G H I, to the mold wheel, so that they shall swing and shut directly down over the molds, and be raised directly up therefrom, substantially as and for the purpose herein specified.

I also claim the arrangement of the cam guides, M N, in combination with lids, F G H I, substantially as and for the purpose herein specified.

I also claim the construction and arrangement of the cam tracks, m n p, in combination with the followers, substantially as herein set forth.

I also claim the combination of the vertically-closing and opening lids, F G H I, with the forms for imprinting on the lower surfaces thereof, for the purpose herein specified.

45,564.—Raising and Lowering Window Sashes.—John M. Merrymon, of Indianapolis, Ind., assignor to himself and Wm. Gorsuch, of Richmond, Ind., and Kilby Ferguson, of Indianapolis, Ind.:

I claim the use and application of one continuous cord, c, in the manner and for the purposes as herein described.

45,565.—Machine for Cutting Objects with Straight Sides and Semi-Circular Ends.—Charles W. Packer (assignor to himself and George Bates), of Philadelphia, Pa.:

I claim, first, A slotted plate with straight parallelled edges and semi-circular ends, guided by the pin, h, and strip, p, in combination with the rotary cutters, or their equivalents.

Second, So constructing the said plate of two pieces, I and I', that it can be elongated or shortened at pleasure.

45,566.—Detached Shirt Collar and Bosom.—Celius E. Richards, of North Attleboro', Mass., assignor to Wm. H. Conant, of Boston, Mass., and Geo. A. Shephardson, of Attleboro', Mass.:

I claim, first, Stamping the collar and bosom in one piece, substantially as set forth.

Second, In combination with such collar and bosom and the cravat bow, made as described, I claim the feord, D, and fastening, C, or its equivalent, the same being substantially as and to operate in manner and for the purpose as explained.

45,567.—Sabot for Projectiles for Rifled Ordnance.—C. W. Stafford (assignor to American Projectile Company), of New York City:

I claim the cup-shaped packing disk, D, provided with an annular flange, F, fitting upon a wedge-shaped rebate, G, as herein described and for the purpose set forth.

45,568.—Apparatus for Vaporizing and Aerating Volatile Hydro-carbons.—Levi Stevens, of Fitchburg, Mass., assignor to himself and John D. Sargent, of Boston, Mass.:

I claim the combination of a flowage regulator, for the purpose hereinbefore explained, with an apparatus for vaporizing and aerating a volatile hydro-carbon, the said regulator being made to receive the hydro carbon from a reservoir, and to operate substantially as hereinbefore described.

I also claim the flowage regulator, made substantially as hereinbefore explained, and with its inlet air to be either stationary or capable of being adjusted in manner and for the purpose as set forth.

I also claim the improved hydro-carbon vaporizer, constructed substantially as described, with the chamber, r, the foraminous plates, l and m, and the pipes, n o, arranged and combined together, and with the surrounding case or vessel, z, in which they are placed, substantially as described.

45,569.—Method of Preparing and Preserving Food.—John McCall, of London, Eng., and Bevan G. Sloper, of Walthamstow, Eng., assignors to Charles J., William J., and Charles H. Underwood, of Boston, Mass. Patented in England April 9, 1864:

We claim the within-described constructed food tablets, prepared substantially in the manner set forth.

RE-ISSUE.

1,834.—Railroad Car Axle Boxes.—R. N. Allen, of Cleveland, Ohio.—Patented March 23, 1858:

I claim, first, Constructing the cavity on the inside of the case, E, in such manner as to allow an easy adjustment of collars or washers on the axle, through the front opening of the case, substantially as set forth.

Second, I claim the employment or use of the collar or washer, F, in combination with the case, when said collar or washer is adjusted to and in its place on the axle through the front opening of said case, substantially as and for the purpose set forth.

Third, I claim the movable brace, G, and the end of the key, C, in combination for holding the washers in their place against the back end of the case, substantially as set forth.

Fourth, I claim the described curved surface on the upper side of the bearing box, B, on either side of the key, C, or on the inner surface of the case, in combination with the bearing box or key, for the purpose set forth.

1,835.—Apparatus for Forming Collars.—Solomon S. Gray, of Boston, Mass. (Div. A.) Patented July 5, 1864:

I claim, first, The combination of the former, D, with the elastic band or its equivalent when operating sustantially as herein described.

I also claim holding the strip or collar by its two ends, while the former is being forced into or through it, to mold it to the desired form, substantially as described.

I also claim leaving that portion of the strip or collar that is to be molded unclamped or free, while the other portion is firmly held, so that a former moving past it may mold or stretch said free portion, as described.

1,836.—Apparatus for Forming Collars.—Solomon S. Gray, of Boston, Mass. (Div. B.) Patented July 5, 1864:

I claim, as an article of manufacture, a paper, or a paper and cloth collar, having its upper or turned over portion, molded or stretched, substantially as and for the purpose herein set forth.

1,837.—Apparatus for Boring Artesian Wells.—Henry Hannen and John Parker (assignees by mesne assignment of Jesse N. Bolles), of Philadelphia, Pa. Patented April 14, 1857:

I claim, first, The combination of a drill or cutter, A, with tubular rods, through which the detritus is caused to pass upward, and to be discharged at the point described, substantially as specified.

Second, One or more valves, f, arranged within the tubular drill rods of a well-boring machine, substantially as and for the purpose set forth.

Third, The drill or cutter, A, composed of the portions, a a, and cross piece, b, constructed and arranged substantially as and for the purpose set forth.

1,838.—Harvesting Machines.—A. Kirbey and David M. Osborne (assignees of Wm. A. Kirbey, aforesaid), of Auburn, N. Y. Patented July 2, 1861. Re-issued June 9, 1863:

I claim, first, In combination with an automatic rake, an adjustable shaft, for the purpose and in the manner substantially as described.

Second, In combination with an adjustable shaft of an automatic rake, the universal joint, k', for the purpose and in the manner substantially as described.

Third, In a harvesting machine, having an adjustable connection between that part which carries the automatic rake, and that part which carries the gearing, the adjustable shaft and universal joint, substantially as and for the purpose described.

1,839.—Revolving Fire-arms.—The Brooklyn Fire-arms Company (assignee by mesne assignment of Frank P. Slocum), of Brooklyn, N. Y. Patented April 14, 1863:

I claim, first, The construction of a revolving fire-arm, with independent longitudinally-movable chambers, in combination with openings in the sides of the cylinder of sufficient size to permit the lateral insertion of metallic cartridges, without removing the chambers entirely from the cylinder.

Second, The stationary piston, applied in combination with the revolving cylinder, and its independently-movable chambers, substantially as and for the purpose herein described.

Third, The projection, f f, on the longitudinally-movable chambers, D D, in combination with the longitudinal openings, C C, of the cylinder, substantially as and for the purpose herein specified.

Fourth, The notches, z z, in the sides of the longitudinal openings, C C, of the cylinder, in combination with the projections, f f, on the longitudinally-movable chambers, substantially as and for the purpose herein set forth.

DESIGNS.

2,016.—Match Box.—Edward Burke, of Philadelphia, Pa.

2,017.—Trade Mark.—Israel A. Powell, of Lawrenceville, Ill.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three ast ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These prelim examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

The Patent Laws, enacted by Congress on the 2d of March, 1861, now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their invention by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, &c.

FOREIGN PATTENS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

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Notes and Queries

C. C., of Conn.—The best test for the presence of lead in water is sulphuretted hydrogen, which produces a black deposit.

D. McD., of Wis.—The weight is, as you say, the principal objection to traction engines for plowing, reaping, etc. In England they are used to some extent in dockyards, but the use does not seem to extend very rapidly, probably because there are few places in which they are more convenient than horses.

J. H., of Pa.—You will find the geology of petroleum very fully stated in No. 20 of our last volume, pages 308, 314 and 315.

J. S. T., of Va.—We do not know of any place where a diagonal connection between a brace and bit can be had. Get some mechanic to make one.

J. E., of Mass.—Buy "Bourne's Catechism," it is far better than Campin's work. H. C. Baird, 406 Walnut street, Philadelphia, will furnish it.

T. F. C., of Wis.—A slide has been used to cover the outside keyhole when the door is locked. If you will submit to us a sketch of yours we will give our opinion in regard to it.

O. B., of Mo.—The Justice must affix to the oath attached to the specification a five cent revenue stamp. The certificate of an individual who has witnessed the operation of a machine does not require a stamp.

E. S. V., of Pa.—We gave Mr. Burns address in our paper in connection with his letter. If you desire to reach him more particularly with your invention, you had better advertise it in our paper.

B. E. C., of S. C.—We shall be glad to receive from you an article upon the salt deposit upon steam boilers.

D. S., of Mass.—The cheapest plan for making hydrogen on a large scale is by decomposing water by means of heated charcoal or coke; zinc is a very costly material for this purpose. You can easily try an asbestos wick and see whether it will work.

E. J., of Mass.—Ivory is bleached by soaking it in water, and exposing it to the action of the sun.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Dec. 14, 1864, to Wednesday, Dec. 21, 1864:—

T. L., of N. Y., $20; H. W. H., of Conn., $20; I. F. B., of Conn, $20; M. C. D., of Ohio, $20; J. H. S., of N. Y., $20; H. Y., of N. Y. $20; C. F. B., of N. Y., $45; J. S., of Ill., $45; F. L., of N. Y., $15; J. P., of N. J., $45; H. & W., of Cal., $25; H. B., of N. Y., $15; W. H. S., of N. Y., $20; T. S., of N. Y., $20; J. M., of N. Y., $40; J. B., of N. Y., $20; D. C. H., of Pa., $20; J. McG., of N. Y., $10; C. C., of Conn., $45; W. & S., of Pa., $30; J. C. G., of N. J., $15; C. M. & G. R., of N. Y., $15; 'A. T. B., of N. Y., $25; B. & M., of N. Y., $45; W. H., of N. Y., $15; Z. P. L., of Conn., $20; J. & N. W. R., of Mass., $25; D. S., of Cal., $20; H. H., of Ill., $20; L. H., of N. Y., $22; O. R. B., of N. Y., $40; J. T. P. H., of N. H., $45; P. W., of Minn., $20; J. W. N., of Conn., $40; J. F., of N. Y., $15; A. B., of N. Y., $20; E. H., of Ill., $20; W. N., of Mass., $25; J. S., of N. Y., $20; B. F., of N. J., $10; J. L., of Conn., $15; J. J. R., of Ill., $25; J. A. R., of Pa., $16; W. G. B., of Mass., $20; A. M., of N. Y.. $15; W. S., of N. Y., $22; W. & McG., of Iowa, $20; C. H. B., of N. Y., $40; G. W., of Mass., $20; M. R. H., of N. J., $45; G. M., of N. Y., $40; G. E. H., of Maine, $20; T. N. D., of Ind., $20; J. M. F., of Ill., $20; H. M. H., of N. Y., $45; D. H. H., of Ohio, $45; A. & F., of N. Y., $15; T. V. W., of N. Y., $10; E. H. M., of Iowa, $20; J. C. S., of Mass., $20; A. K., of Ill., $20; W. K. L., of Mass., $16; J. C., of Ill., $15; J. A., of Ill., $30; J. C. & G. S., of Mass., $16; C. H. S., of Ill., $45; W. R. L , of Conn., $15; J. R., of Ind., $25; T. J. L., of R. I., $15; W. H. & G. W. M., of Conn., $45; D. F. W., of Ky., $25; W. E. R., of Ill., $15; W. C., of Ohio, $15; J. B., of N. Y., $15; L. & D., of Canada, $25; H. & C., of Mich., $35; A. H. W., of Maine, $15; H. K. J., of Conn., $40; B. F. W., of Ind., $16; R. & C., of Conn., $25; E. B. T., of Mass., $16; J. C., of N. Y., $25; J. L., of Mass., $25; E. W. S. & Co., of Wis., $16; J. L. B., of Pa., $15; I. A. P., of Ill., $25; F. M. G., of Pa., $25; G. W. S., of Pa., $15; D. McC., of Ohio, $25; J. H. N., of N. Y., $15; S. J. C., of Conn., $25; H. H., of N. Y., $10; C. H. P., of N. Y., $16; J. N., of Mass., $25; T. L. S., of Mass., $50; V. W. B., of Vt., $15; F. G. F., of Ill., $15; E. & K., of Pa., $53; E. N., of La., $20; F. W. E., of Mich., $20; W. L. C., of Wis., $10; T. R., of Cal., $25; T. H. C., of Mo., $40; D. G. F., of Wis., $15; M. H., of Mich., $10; J. F. W., of N. H., $16; W. F., of Conn., $15; J. H. P., of Mich., $15; J. B., of Ill., $30; Mrs. L. E. S., of Ill., $25; J. M. C., of Mass., $15; A. & H., of Conn., $250; T. M., of N. Y., $25.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to

parties with the following initials have been forwarded to the Patent Office, from Wednesday, Dec. 14, 1864, to Wednesday, Dec. 21, 1864:—

T. L., of N. Y.; A. T. B., of N. Y.; G. M., of N. Y.; H. M. H., of N. Y.; W. & S., of Pa.; D. F. W., of Ky.; J. J. R., of Ill.; R. & McM., of Ky.; O. P. S., of Ill.; K. & E., of Pa.; J. N., of Mass.; R. & C., of Conn.; A. K., of Pa.; W. S., of N. Y.; O. R. B., of N. Y.; C. H. S., of Ill.; I. A. P., of Ill.; J. C. G., of N. J.; J. L., of Mass.; J. E., of Cal.; S. J. C., of Conn.; H. C., of Maine; T. L. J., of Mass. (2 cases); H. L., of Iowa; A. P. D., of N. J.; C. H. B., of N. Y.; J. W. N., of Conn.; D. McC., of Ohio; T. R., of Cal.; J. C., of N. Y.; J. R., of Ind.; W. H. & G. W. M., of Conn.; C. H. S., of N. Y.; Mrs. L. E. S., of Ill.; C. D. F., of Cuba; L. H., of N. Y.; T. M., of N. Y.; S. & B., of Mich.; F. M. G., of N. Y.; A. & G. W., of Iowa; J. G., of Mich.; H. K. J., of Conn.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

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TERMS FOR VOL. II. 1865

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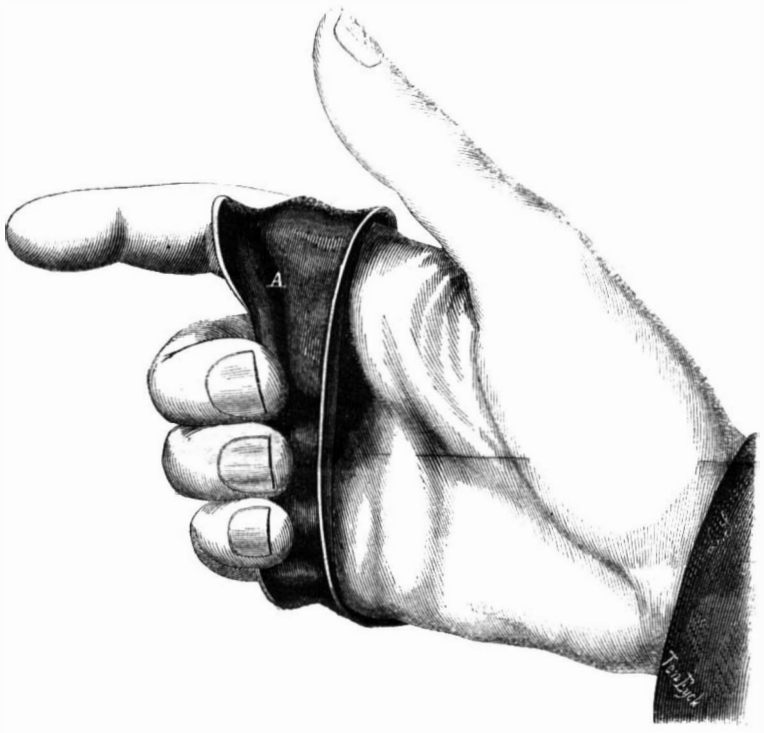

BRINKERHOFF'S OHIO CORN HUSKER.

and has given perfect satisfaction. The inventors say they have not be able thus far to supply the great demand for them.

This invention was patented by A. W. Brinkerhoff, of Upper Sandusky, Ohio, Sept. 2, 1862, and is manufactured by Messrs. Wood, Fowler & Beery, of the same place. They are sold for fifty cents each, with discount to dealers.

For further particulars apply to either of the above parties, at Upper Sandusky, Ohio.

No territory for sale.

Preparation and Properties of Rubidium.

In the *Annalen der Chemie und Pharmacie*, Prof. Runsen gives an account of his last experiments on rubidium. The latter may be reduced from carbonated acidiferous tartrite of oxide of rubidium (in a manner similar to the reduction of kalium). 75 grains of that salt will yield 5 grains of pure metal melted to a compact mass. It is very light, like silver; its color is white, with a yellowish *nuance* hardly perceptible. In contact with air it covers itself immediately with a bluish gray coating of suboxyd, and is inflamed (even when in large lumps) after a few seconds, much quicker than kalium. At a temperature of 14° Fah., it is still as soft as wax; it becomes liquid at 101·3° Fah., and in red heat it is transformed into a greenish-blue vapor. The specific gravity of rubidium is about 1·52. It is much more electropositive than kalium, if combined with the latter to a galvanic chain by acidiferous water. The rubidium, thrown on water, will burn and show a flame of the same appearance as that exhibited by kalium.

Preserving Flowers.

Mr. C. R. Tichborne states that, being desirous of preserving a vegetable *lusus naturæ* for some time, he submerged it in some weak glycerine, considering that that fluid would be less likely to destroy the tender organism, and also remembering that it had been found most efficient in the preservation of animal tissues. The glycerine answered its purpose most admirably, preserving the delicate parts of the plant and preventing decomposition. He immediately saw that this property of glycerine might be made available for certain pharmaceutical purposes, where it was desired to preserve or extract the aromata of vegetable products, such as elder, orange, or rose flowers, and also might be substituted for the oils and fats used in the purest process termed enfleurage. The glycerine need not be especially pure, but should be devoid of odor. The elder-flowers should be gathered when the corolla is fully expanded, but not too far gone; they should then be plucked from the stem, and packed firmly in wide-mouthed bottles or jars, without crushing them; and the whole should then be covered with glycerine. Mr. Tichborne says that he has thus preserved flowers for two years, and, on distilling them, procured a water, the perfume of which has equalled the most recent product. For the preservation of the flowers he considers the employment of glycerine far superior to the system termed enfleurage, in which heat is used.

PORTER'S SIFTER SHOVEL.

Every economical housekeeper sifts the ashes and refuse coal left after the fire has been turned out at

night. By so doing a very marked saving occurs, fully equal to one-third of the whole ash heap.

A shovel which combines a sifter with its other qualities is a very convenient article for the purpose referred to; the one here illustrated is well designed for the object in view. It is made of cast-iron and has a grating at the back part for the ashes to fall through. This shovel is also useful for carrying fire from one place to another, for by the introduction of the grate a draft is maintained which keeps the coals alive much longer than ordinary shovels. A patent was issued to J. H. Porter on the 3d of December, 1864, through the Scientific American Patent Agency. For further information address him at 15 Hudson street, New York.

Silk Worms for France.—The San Francisco *Bulletin* says: "Macondray & Co. will ship by the *Constitution*, 64 cases of silk worms, which were recently received from Japan, on an order for parties in France. They will be conveyed to New York and thence to Havre. The French silk worms have become diseased, and it is proposed to try the experiment of restoring them to health by admixture with a new stock, or by substituting the latter for them entirely. The Japanese worms produce a very good quality of silk. It may not be generally known in this connection that Provost, the California silk culturist, has for a considerable time been forwarding his healthy larvæ to France."

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